THE

Monthly Nautical Magazine,

AND

QUARTERLY REVIEW.

VOL. II.

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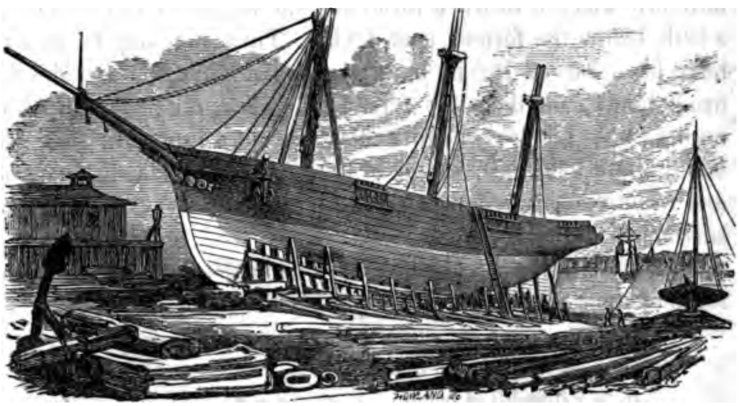


CLIPPER SHIP GREAT REPUBLIC.

ALTHOUGH the memorable era of clipper ship-building, which derived its wonderful impetus from the trade with California, may be said to have closed with the mercantile depressions of the past year, yet we think it will be expected that we should urnish a description of the king of clippers, when we regard the dimensions, known as the four-masted ship "Great Republic." This magnificent vessel, as she came from the hand of her builder, was not destined to try her bottom upon the ocean. In the winter of 1853-4, or rather more than a year ago, while on

the eve of sailing from New-York, having her cargo on board, the "Great Republic" took fire from a conflagration, which consumed several warehouses near the dock where she lay, and was burned below the third deck.

But this unfortunate accident did not entirely frustrate the design of giving to the swift fleet of American clippers the largest merchant ship in the world. The Great Republic was sold by the Underwriters to Captain N. B. Palmer and others, of New-York, who immediately proceeded to place her under the charge of Messrs. Sneeden & Whitlock, ship-builders, at Green Point, L. I., for reconstruction.

Being originally built with four decks, the upper being a light spar-deck, it was not thought proper by her present owners to finish her in the former manner, so the fourth deck was not added. In consequence of this determination, the bed of the bowsprit was cut down a little, and the height of rail was fixed a little below the former spar-deck. Thus she may be said to have been razeed before having sailed a voyage. Beside the usual houses on deck for forecastle, galley, &c., this ship has nothing now above her third deck except a forecastle forward, and a trunk cabin aft, which is entered from the deck forward, and from a steerage deck aft, at the height of the main rail that surrounds the cabin.

These comprise the chief alterations in the hull. The dimensions of the "Great Republic" are as follows:—

Length on spar-deck, which was removed	325	feet.
Length on load-line of construction	314	"
Extreme breadth of beam	53	"
Depth from base to plank-sheer, third deck	32½	"
Depth of hold, as rebuilt	29½	"

The keel, for sixty feet forward, is gradually raised above a straight line, blending into an arc of a circle in its connection with the stem, which curves forward with the knight-heads. She has about twenty inches dead-rise, a floor carried well fore-and-aft, with an easy bilge, and considerable tumble home to the sides above load-line. The bow is wedge-like, being slightly concave below water, and convex above, with much sameness in shape, and by no means artistic in model. The stern is elliptical,

rising from a knuckle. The side-line is convex, but not sufficiently so to give symmetry to her gigantic proportions. We regard her as deficient in breadth to spread the rigging sufficiently, to say nothing of stability for the due security of the enormous propulsory power with which she was originally provided. Her masts have been shortened in consequence, as we shall see by the list on page 6. We do not regard her model as equal to those of the *Flying Cloud* or *Sovereign of the Seas*, by the same builder, Donald McKay, of Boston.

The keel of the Great Republic is of rock maple, in two tiers, which, combined, side 16 inches, and mould 32, the scarphs being 12 feet long. The shoe is 4½ inches thick. Her frame is of selected seasoned white oak. Floor-timbers are sided from 12 to 15 inches, and moulded 22; and the top-timbers vary from 11 to 13 inches sided, by 8 inches moulded. The space of frames from centre to centre is 26 inches. All the frames are doweled, in addition to the usual bolts. The dowels, or coags, are of white oak, round, 3¼ inches diameter, and 3½ inches long, joining both parts of the frame together; after which an inch bolt was driven through the frame and the heart of the coag. It is supposed that this manner of driving the frame-bolts through the coags will protect them from corrosion by salt water. The stem is sided the same as the keel, and is moulded 2 feet at the fore-foot and 20 inches at the head, being tapered to correspond with the lines of the bow. The apron is 4¼ feet, moulded in several pieces. Every through bolt in the stem and apron is of 1¼ inch copper up to 26 feet draught, and within about 9 inches of each other. The stern-post is in three pieces, coaged and bolted together, sided same as the keel, and moulded from 5 to 6 feet. The stern-knee is sided 16 inches, moulded 3 feet at the throat, extending 8 feet up the post, and 20 feet along the keel, scarphed to the keelson, and bolted as the stem. The frame is diagonally cross-braced with iron 4 inches wide, 1 inch thick, and 36 feet long, extending from the floor-heads to the top-timbers. There are 90 of these on each side, bolted through the timbers with inch iron, and riveted at the crossings.

Her keelsons, ceiling, and deck-frames, are of hard pine. She has four tiers of midship keelsons, each 15 inches square, and

three tiers of sister keelsons—the two first 15 inches square, and the upper one 12 by 14 inches. These are all coaged, lock-scarphed and square-keyed, and bolted with $1\frac{3}{8}$ inch copper bolts through every floor-timber and the keel—the first driven through the timber and the keel, and the second through the first and second tiers of keelsons also, and all riveted on the base of the keel. The heels of first futtocks, or naval timbers, are bolted through all the keelsons with iron, driven into the keel within a few inches of its base. These bolts were driven by a machine. The sister keelsons are bolted diagonally through the naval timbers into the keel, and horizontally through the mid-ship keelsons. The whole depth of her *back bone,* from the top of the keelsons, including the moulding of the floors to the base of the shoe, is 9 feet 10 inches, and its width over the throat of floors is 3 feet 9 inches.

There are nine strakes, of 10 by 12 inches, on the floor, all scarphed, square-fastened through the frames, and bolted edge-ways every 5 feet. Over the floor-heads are four bilge keelsons, each 15 inches square, in two depths. These are also coaged, scarphed, keyed, square-fastened with $1\frac{1}{4}$ inch iron, and bolted edgeways. The ceiling above is in two thicknesses, the first 6 inches, and the second 15—the latter covering all the scarphs of that below, and is itself scarphed, and both are square-bolted. The whole bilge is double ceiled in this style up to a lap strake of 6 by 15 inches, upon which the lower ends of the lower deck hanging-knees rest. The lower deck clamps are also in two depths, of 6 and 10 inches thickness, worked in the same manner.

The water-ways of the lower and main decks are 16 inches square, the strake inside of them 10 by 12, and the thick work over them 12 by 18; and the water-ways and deck-strakes are coaged in every beam, and bolted through the coags, and also bolted vertically and horizontally. The ceiling above is 8 inches thick, scarphed, keyed, and square-bolted, and the clamp under the upper deck beams is 12 by 15 inches.

The upper deck water-ways are 12 by 13 inches, with one strake inside of them of 8 by 13 inches, worked in the same

manner as above. Her rails are eight inches thick by 20 wide.*

Her garboards are 10 by 14 inches, bolted through the keel and the timbers. The next strake is 9 inches thick, and the third 8, chamfered off to 6 inches, the thickness of the bottom plank. Bilge-planks are 8 inches thick; the wales 6 by 8 up to the moulding below the plank-sheer, and is 4½ inches thick.

The lower and main deck beams are 15 by 16 inches amidships; the upper deck beams are 12 by 15 inches; and 25 of them are double, bolted together, and sided 22 inches. There are 38 lower deck, 40 main deck, and 41 upper deck beams. The berth and hanging-knees of lower and main decks are oak; of the upper deck, hackmatack. The hanging-knees are sided from 10 to 13 inches, moulded from 22 to 24 inches in the throats; the bodies are from 5 to 6 feet, and the arms from 4 to 4½ feet long. The lower and main deck berth-knees are sided 8 inches.

Upon the ceiling between the main and upper decks, diagonal braces of hard pine are worked from the throat of one hanging-knee to the foot of the other, and bolted through the ceiling and the timbers. The upper deck fore-and-aft framing is in three courses: the middle course is 8 by 14 inches, framed fore-and-aft, and kneed by four small knees between each pair of beams—in all 144 knees. The other courses are framed diagonally. The decks are 3½ and 3 inches, and the thick strakes amidships and over the wing stanchions are coaged, and bolted to the beams.

She has three tiers of stanchions, fore-and-aft, supporting the lower and main deck beams. These stanchions are in two pieces, which, when united at the centre of the beam, are 10 by 23 inches. The wing stanchions are stepped into the bilge keelsons, and all are double-kneed to the same. The midship stanchions are stepped into the main keelson, and the knees are scarphed in every berth. All other deck stanchions are of oak

* As at first built, the upper deck plank-sheer was 7 inches thick, above which she was ceiled with 3½ inch plank up to the spar-deck clamp, which was 6 by 14 inches. The plank-sheer of the spar-deck was 7 by 20 inches, upon which a chock of 12 by 6 inches received the heels of turned stanchions 3½ feet high, protected by a spar-deck rail 5 by 12 inches.

turned, 10 inches in diameter, secured with iron rods through their centres, which are set up with screw-nuts.

Her hooks and pointers are of white-oak. In the hold, forward, are three sets of pointers, from 30 to 40 feet in length, and of 9 to 11 inches square, which fay into the angles between the keelsons and the skin, and are filled in with hooks; they cross all the cants diagonally, and fay to the lower deck beams. About 5 feet above the keelsons is a horizontal hook, shored off with two beams, and secured by eight knees. The stern is strengthened in the same manner. The iron water-tanks are cylindrical in form, and extend to the upper deck, one being placed 64 feet before the mainmast, and the other 24 feet abaft of it. She has four hold-pumps. All her hatchway combings, and mast-partners are kneed to the beams.

The Great Republic now, as originally, has four masts, and their positions have not been changed. The after one is named the spanker-mast, and is made of a single spar. The others are built of hard pine, doweled together, bolted and hooped with iron bands. The bowsprit is also built and hooped. She had Forbes's rig before she was burned, but is now fitted with Howe's rig on the fore, main, and mizzen masts.

The following are the dimensions of her masts and yards as refitted:—

MASTS.

Foremast, 90 feet long; head, 18 feet; partners, 41 inches.
Fore-topmast, 53 feet long; head, 10 feet; diameter, 20½.
Fore-top-gallant mast, 29; royal, 18½; skysail, 13; pole, 10; cap, 15 in.
Mainmast, 95 feet; head, 18 feet; partners, 41 inches.
Main-topmast, 55 feet; head, 10 feet; diameter, 20½ inches.
Main-top-gallant mast, 29 feet; royal, 18½; skysail, 13; pole, 10; cap, 15.
Mizzenmast, 86 feet; head, 14 feet; partners, 34.
Mizzen-topmast, 45 feet; head, 9 feet; diam., 17 inches.
Mizzen-top-gallant mast, 23 feet; royal, 13½; skysail, 10; pole, 9; cap, 13.
Jigger-mast, 68 feet; partners, 28; head, 12.
Jigger-topmast, 38 feet; top-gallant, 20; skysail, 14; pole, 7; cap, 15.

YARDS.

	Length, feet.	Arms, feet.	Slings, inches.	Grummets.	Ends.	Booms.
Main Yard	90	5	24	13½	11½	10
Fore Yard	85	5	24	13½	11½	9½
Cross Jack Yard	72	4½	20	11½	9½	—

	Length. feet.	Arms, feet.	Slings, inches.	Grummets.	Ends.	Booms.
Main Lower Topsail	81	4½	20	11¼	9¼	—
Main Upper Topsail	72	5	18	10½	8¼	8¼
Fore Lower Topsail	76	4½	20	11¼	9¼	—
Fore Upper Topsail	67	5	18	10½	8¼	7¾
Mizzen Lower Topsail	63	4½	16	9½	7¼	—
Mizzen Upper Topsail	55	4	14	8	6¼	—
Main-top Gallant Yard	54	3½	14½	8	6½	—
Fore-top Gallant Yard	49	3½	13½	7¾	6	—
Mizzen-top Gallant Yard	43	2½	11½	6¼	5	—
Main Royal Yard	43	2½	11½	6¼	5	—
Fore Royal Yard	38	2½	10½	5⅝	4½	—
Mizzen Royal Yard	32	2	8	4¼	3¼	—
Main Skysail Yard	32	1½	8	—	—	—
Fore Skysail Yard	27	1½	7	—	—	—
Mizzen Skysail Yard	21	1	5½	—	—	—

Spanker Boom, 42 feet; pole, 2 feet.
Spanker Gaff, 36 feet; pole, 6 feet.

As originally fitted, her masts and yards were as follows. It will be seen that her propelling power has been immensely cut down, and she will now carry but little more than half the number of crew formerly designed—namely, 52 seamen only.

MASTS.

	Diameter. inches.	Length. feet.	Mast-heads, feet.
Fore	44	130	36
Top	24	76	12
Top-gallant	18	28	0
Royal	15	22	0
Skysail	11	19	pole, 12
Main	44	131	36
Top	24	76	12
Top-gallant	18	28	0
Royal	15	22	0
Skysail	11	19	pole, 12
Mizzen	40	122	33
Top	22	69	10
Top-gallant	16	22	0
Royal	10	19	0
Skysail	8	15	pole, 8
Spanker	26	110	14
Top	—	40	—

	Diameter. inches.	Length. feet.	Mast-heads, feet.
Fore	26	110..yard arms,	6
Lower Top	24	90	5
Upper Top	19	76	4½
Top-gallant	15	62	4
Royal	12	51	3½
Skysail	9	40	3
Main	28	120	6
Lower Top	24	92	5
Upper	19	76	4½
Top-gallant	15	62	4
Royal	12	51	3½
Skysail	9	40	3
Cross Jack	24	90	5
Lower Mizzen-top	19	76	4½
Upper " "	15	62	4
Top-gallant	12	51	3½
Royal	9	40	3
Skysail	6	29	2

Spanker-boom, 40 feet long—pole off, 2 feet; gaff, 34 feet—pole off, 8 feet.

The bowsprit is 44 inches in diameter, and was originally placed 30 feet out-board, but has been shortened to correspond with the masts.

Her fore and main rigging, and fore and main topmast back-stays, were 12½ inch patent rope, wormed, and served over the eyes, and over the ends to the leading trucks. Other rigging in proportion. The Great Republic has four anchors. Her best bower is Porter's patent, weighing 8,500 lbs.; the working bower is 6,500 lbs.; the small bower, 2,500 lbs., and the kedge 1,500. Her bower chains are each of 2½ inch.

The Great Republic is furnished with a steam-engine of 15 horse-power, for handling cargo, ship, &c. She is now on her first voyage to London, having cleared for that port on the 21st day of February last.

Lest it should be forgotten that at least one ship of greater magnitude than the Great Republic has long since crossed the Atlantic, we give a brief notice of the timber ship "Baron of Renfrew," built at Quebec, in 1825, by Charles Wood, of Port Glasgow. Dimensions: 304 feet long, 61 feet beam, and 34 feet

hold. Registered tonnage, 5,294 tons. Cargo of pine timber, 8,500 tons. She, too, was rigged with four masts. She was built of solid pine timber, in order to evade the home duties upon the same, and was known as the "Raft Ship." After a long and tedious passage, she arrived safely in England, and was broken up.

THE VALUE OF CALCULATIONS IN MODELLING.

We are always pleased to hear from correspondents regarding their views of the various questions of interest to ship-builders, especially of those bearing upon the production of superior models. It is, doubtless, a conceded fact among commercial men qualified to direct the progressive movements of ship-building at the present day, that the superiority of shipping depends upon the *model*. The supremacy of the United States, as a commercial nation, rests upon the *shape* of her ships; and the enterprise of her mechanics must ever keep the lead in perfecting the composition of the superior qualities of her vessels, if they would maintain their present proud position before the world. In saying this, we think we shall be fully justified by the practical intelligence of every man who has watched the progress of ship-building in the orbit of his own observation.

Let us suppose the reader to grant the truth of our proposition. What then? Why, the inference follows, that more laborious investigations, and more skillful modelling will be required, to carry forward our noble art in advance of other countries, and at a pace corresponding to the progression of its sister arts and sciences. The day is coming, nay, we have already seen the day, when the conceited architect, who folded his arms in mysterious wisdom, and hove-to, scorning to learn *one* more principle from the page of science, awoke upon a fine morning to observe his industrious apprentice passing him to windward on the path to fame. We are of those who believe in making all sail in fair weather, always lay our course when we can, head our craft to the gale, and never "lie-to" under a *free wind.* The indefatigable student of marine architecture,

which is a science of principles, will ever be rewarded by gratifying results.

The contest for commercial supremacy is every day becoming more purely scientific, and the wholesale blunders of intuition will yet give place to the tangible certainties of *calculations.* The time has been when the navigator directed his bark by the flight of birds, the drifting kelp, or the intuitive judgment of a daring spirit, when the waste of waters shut the land from view. But who now goes to sea without compass, chart, and chronometer—without the instruments and science which mathematicians have devised for determining every foot of the ocean beneath the mariner's keel? It will yet be even so with the construction of the mighty fabric that ploughs the high-way of commerce. Nor are we without numerous examples of the advantages of applying calculations to the models of vessels. We do most certainly know that some of the most successful vessels of the present day were carefully submitted to the ordeal of mathematical investigation before their models were finished and adopted; and the time has always proved to have been well spent in analyzing the qualities of any model in question, and in reducing its points to the proper standard.

We have been led to these remarks upon the receipt of a correspondence from a highly intelligent ship-builder, who, nevertheless, fancies that *genius* is an all-sufficient alcahest, and the only aid required in modelling vessels is a cultivated eye. Were it designed by Nature that man should be a *hopping* rather than a walking being, one limb would have been ample for the important purposes of locomotion; but inasmuch as it has been seen fit to endow him with a full complement of propellers, the inference is conclusive that the former is not his natural gait, and is only to be resorted to when one of his supporters has been damaged, or docked for repairs. We believe in the use of all the instrumentalities in our power, especially when rivalry demands our best exertions. But we will quote our correspondent.

He says: "The time is far distant, I think, when *practical* ship-builders will adopt the plan of a correct mathematical calculation as to the merits of his ship before building her; for who is it that has ever worked up the areas of water-lines for dis-

placement to find the weight of ship and cargo, without entering into figures to find the best shape, the centre of effort, propulsion, equilibrium, and, in fact, the centre of all force above and below, inside and outside? Not he who builds his six or eight ships in one year. Drafting, modelling, and laying down ships, with the other business of the ship-yard, will give him full employment."

We would remark, that when ship-owners shall deem it to be to their interests to ascertain the inherent qualities of their ships, before it has cost them, perhaps, thousands of dollars to test them experimentally at sea, there will be found sufficient duration of "time" and money to compensate the investigation. Shall the inherent qualities of a sixpenny loaf be the subject of analytic inspection, and ships be ever built by guess-work, and launched upon the ocean in uncertain destiny to combat the most fearful elements of nature? We think not.

The writer continues: "The *practical* ship-builder—the one of experience—will build a very good proportioned ship by *comparison*. What I mean by 'practical' and 'comparison' is this: the owner gives his dimensions to the builder, and he goes to work after this manner:—With his scale and dividers in hand, he takes up the model of some previous ship that he has built; and if he is after speed, he knows the good and bad qualities before him. It may be that bad qualities predominate, such as instability, bad sailing qualities, &c., &c., and he avoids committing the same error over again. By this way of working, I modelled the ship ——, [one of the finest clippers,] and her commander thinks that she performs well, goes and returns quickly, and carries a large cargo, and delivers it in good order; and by her log of the last and previous passages, it appears that the captains of the most famous clipper-ships had a chance to prove her good qualities; and I think that she is all right, that is, for her dimensions. Now, what more, in the name of science or philosophy, is wanted to *prove* her *inherent qualities* good?" All very well—upon the principle that "all is well that ends well."

But our correspondent is, doubtless, informed of numerous wholesale blunders in the construction and equipment of vessels of every description, from the steam-ship to the pilot-boat, in-

volving millions of dollars in the aggregate, that might have been disclosed by the use of figures, and avoided, but were only brought to light when it was too late. It would be tedious, but not unprofitable, in this connection, to review the number of "jackets" put on steam-vessels, the enormous quantities of useless ballast carried to trim ship, the forests of spars cut down and altered all over the country, to say nothing of defects that never were thus remedied, but resulted in a disastrous or unprofitable end. The "*practical*" man of our correspondent is, of course, thoroughly posted upon the above experiments; and although we may have had our share of this kind of experience, we do not hold that in this respect ship-building should forever continue a half-developed system of luck and guess-work, after the labors of scientific men have furnished us with a fund of knowledge quite commensurate with its ordinary demands.

Maritime Legislation Neglected.—The short session of Congress was at last closed without accomplishing any results towards securing several desirable reforms in maritime legislation. A revision of the Revenue Laws, to bring them up to the requirements of the age, is very much needed; and a draft of a general Revenue Law, designed to supersede all existing laws on the subject, had been prepared through the indefatigable industry of the Hon. Secretary of the Treasury; but there was not sufficient "time" found to investigate its important improvements. It will come up early at the next session. The tonnage reform, so imperatively demanded by the advancing spirit of nautical mechanism, will be fully provided for in the Secretary's new bill, as we shall take an early opportunity to explain. It will also be seen by another article that the British Parliament has consummated another radical reform in the English Tonnage Laws. Our transatlantic friends are wide awake to the importance of affording fair play to their ship-builders.

An amendment of the Steamboat Law of 1852, so as to fully secure the lives of passengers, by providing for a mode of *life-boat construction* for steam vessels carrying passengers, ought to have been enacted, but was not. We hope it will meet a favorable consideration at the next session.

THE FORBES'S RIG FOR SHIPS.—No. I.

Among the many improvements of the past twelve years that have rendered nautical operations most valuable services in the improved adjustment of spars and canvas to ships, the well-known rig of Robert B. Forbes, of Boston, stands foremost on the list, and deserves our especial commendation ; not, however, because of its general introduction on board of all large ships, for it has not yet received the attention from ship-owners and masters to which it is eminently entitled, but because its advantages affecting *economy, safety*, and *convenience*, excel all others. It very rarely happens that a few brief years are sufficient to furnish "time" for a popular appreciation of any important innovation upon *habits*, whether mechanical, commercial, or nautical. The modest oscillations of science are seldom heeded, till the wave of progress falls as *breakers* at our feet, and we are compelled to move before the advancing flood. The noble and the generous of earth's inventive children impatiently wait the rising tide of destiny, that eventually carries all reforms forward upon the voyage of progress. In obedience to the impressions of duty, we shall, therefore, proceed to lay before our readers the advantages of the "Forbes's Rig," premising first, that the present article will be continued in the next number, in which will also appear a beautiful lithograph of the new packet-ship "Aurora," commanded by Captain Bunting, of New-York. This splendid ship, a Liverpool packet, was built by Wm. H. Webb, in 1854, and is owned by Cornelius Grinnell, Esq., of New-York.

This rig was first introduced by Mr. Forbes, in 1844, and since that time very many of our largest and finest ships have adopted it. Great credit is due to the perseverance and arguments of its inventor, who, although holding no patent, nor having any pecuniary interest in its introduction, but only that noble-hearted, self-sacrificing interest, which moves a generous spirit to labor for the perfection of his profession and his race, has spent both time and money to bring this improvement to the notice of American ship-owners. From a pamphlet published by Mr. Forbes, in 1851, we are glad to be able to give his own description of his Rig :—

"Concerning the best mode of sparring and rigging ships, like most inventors, I imagine I have hit upon the best plan, combining economy *in the long run*, safety *always*, and especially adapted to constant progress, with rather small crews. In 1844 I rigged the bark Edith, and in 1845 the ship Massachusetts, after the following plan, [to be exhibited in the lithographic plate of the "Aurora,] excepting that, in those vessels, the top-masts were fidded abaft, for the convenience of housing, which, as steamships, they might now and then be obliged to do. Whether steamships or not, I consider the fidding abaft as an advantage; but to please the eye, I rigged the Samoset in 1847, and the Reindeer in 1849, with their masts as in the plate.

"As the peculiarities and particulars of this rig are designed to be similar in all cases, we will take the spars of the ship Samoset, rigged for the East India or Pacific trade, to illustrate its adaptations and conveniences.

"The dimensions of the ship are:—Length on deck, 150 feet; extreme breadth, 33; depth, 21; tonnage, about 746.

"The dimensions of the spars are:—

MASTS.

	Feet.	Head, feet.	Diam., inches.	Rake, per ft. in.
"Mainmast, above main rail	58	21	27	1½
Main-topmast, or top-gallant of this rig	49	6	14	—
Main-topgallant, or royal	19	—	8½	—
Main-royal, or skysail mast and pole	23½	—	—	—
Foremast, above rail	54½	20	25	1
Fore-topmast, or topgallant of this rig	44	5½	14	—
Fore-topgallant, or royal	17	—	8	—
Fore-royal, or skysail-mast and pole	21	—	—	—
Mizzen-mast, above rail	55½	17½	19	1¾
Mizzen-topgallant, &c., all in one	58	—	10	—

Spanker-boom, 42—end, 2; gaff, 29½—end, 3.

Bowsprit, outboard	30	—	28 at K. Heads.	

Jib-boom, inside cap, 16½; out, 21; flying, 12; end, 3½; = 53.
The diameter same as topmasts.

YARDS.

	Feet.	End, feet	Diameter, inches.
"Main-yard	71	4	17
Main-topsail and fore yards	62½	4	16 and 15
Main-topgallant, & fore-topsail, & cross-jack	52	3½	12, 11, 10
Main-royal, fore-topgallant, and mizzen-topsail	41	2¾	10, 9, 8
Main-skysail, fore-royal, & mizzen top-gallant	32½	2	8, 7, 7
Fore-skysail and mizzen-royal	26½	1½	6

"It will be perceived by these dimensions, that the sails on the foremast, excepting the foresail, all fit on the main, one stage higher up; that is to say, the fore-yard is the same, excepting a difference in diameter, as the main-topsail yard; the fore-topsail yard is the same as the maintop-gallant yard, excepting in diameter, and the same as the cross-jack yard, and so on;

so that all the sails and yards are available in several places, excepting the main-yard, the fore skysail, and mizzen royal yards—the last two not fitting on the main, unless a main moonsail, or skysail of the old rig, be wanted. The foresail and mainsail are only available where they go in all vessels. The main-topsail, although not exactly a fit for a foresail, not having drop enough, and being cut with gores, will answer very well for a foresail on a pinch, being the same on the head as that sail. The spanker is fitted as usual—either with standing gaft to trail in, or to hoist and lower, or both. The bowsprit is longer than usual; but the lower forestay enters the leader, or B's, in about the same place as in the usual rig; the upper, or 'cap-stay,' enters the leader near the cap, and on the latter a heavy canvas 'inner jib' is set, and it is a very useful sail. The jib and flying-jib require no particular explanation, except to note the fact that, when carrying sail equal to courses, double-reefed topsails, jib, and spanker—the foretop-gallant sail being furled, the spar which I call topgallant-mast, or the fore-topmast of old rig, has little to support except the jib, and is not likely to be crippled by the strain of the double-reefed topsail as well as the jib, as in the old rig. For similar reasons, the flying-jib can be carried longer than usual, without crippling the fore-royal mast or topgallant mast of the old rig—the hoist being less, and the doublings more, in proportion, than those of the old rig.

"Each topsail, topgallant-sail, and the main royal and foresail, have one reef—the mainsail only has two reefs. All these reefs are made, like the courses of a man-of-war, to tie to a 'jack-stay,' or rod of iron, fastened at a proper distance above the bending 'jack-stay,' or batten; both legs of the points, which are shorter than usual, hand forward of the sail; and, when the sail is reefed, the bight of it hangs loosely between the forward side of the yard and the sail—the only disadvantage, found by experience in the Samoset and Reindeer, being, that the loose sail slats about a little, and requires stopping in the wake of the Flemish horses, to prevent chafing; otherwise, the reefs are much snugger, more easily taken in, and the points never foul the sheets of the sail next above. The centre of the sail is adjusted, so that by hauling up a jigger, fast to a toggle at the bunt-cloth, and on a line with the reef, the reef cannot but be about right at the centre; and thus the men at the earings and on the yard can haul out and reef away, without delay, and irrespective of each other. This is a decided convenience, which every seaman can appreciate in a dark night, when, in the usual process, much time is lost in 'lighting out to windward,' and in vain endeavors to ascertain, on the lee yard-arm, whether 'you are out to windward.' These are minor advantages. The greater conveniences and advantages I will endeavor to specify.

"In squally, variable weather, by clewing up topgallant-sails, your ship is, *with the watch*, very quickly brought under sail equal to double-reefs of the old rig, and without losing time by having to haul up the mainsail, which is generally necessary, to double-reef the maintop-sail after it has been carried to the reefing point; and in which operation it is often necessary to

'luff and touch her;' or, if going with the wind on the quarter, 'yaw her off a little,' or 'brace the yards bye.' Every seaman has experienced the labor, in squally latitudes, of having to reef several times during the day or night; and many a one has kept his ship for hours under double-reefs, when he would have been very glad to let them out, if sure he could get them in quickly without calling all hands, and harrassing his crew by repeated calls. The sails can be carried longer, and reduced quicker by the *watch*, than by all hands with the old rig; the masts stand better, are less liable to be carried away, because the strain is distributed by increasing the stays. The sails being in smaller sheets, wear much longer, and are less liable to be split; and in calm weather (so extolled by poets, but so annoying to sailors) the sails are not slatting against the masts nearly so much as larger sails. They are snugger when clewed up in a squall, easier to furl, and, when furled, less liable to be chafed and blown away. Another advantage is found in getting under way, head to wind, in a good whole sail breeze, when it may be very necessary to have the ship quickly under command, and yet not have so much at the mast-head as to trip the anchor too soon.

"Beating through straits in squally weather, when you can gain only by carrying hard and watching sharp, how convenient to be able to reduce to double-reefs, and still carry on! I have several times been compelled (rather than lie-to, or undertake to reef in a squall in narrow waters) to bear up, and lose ground in an hour which it had taken half a day to gain. Again, running for land or shoals to get a departure, as the Palawan passage, and various parts of the China Sea, how much delay, risk, and anxiety, may be avoided, by carrying on topgallant-sails with a fair wind, and even royals; knowing that, in case of making danger on the wrong bow, you can, in five minutes, haul on a wind, and claw off under double-reefed courses! How satisfactory, when running up channel, or for our coast, in thick weather, with a falling barometer and increasing breeze, to be able to carry on nearly whole sail, and perhaps make the desired light or harbor, when any prudent man, with the old rig, should be under double-reefs, ready to haul off!—knowing, as you would, that you are always able to come under double-reefs with the watch, while your neighbor is calling all hands.

Again, for sounding: imagine yourself to be running for George's, or the South Channel, and a thousand other places where the lead is often neglected, for the reason that you cannot heave-to without clewing down or reefing; with the rig I advocate, you can clew up or clew down topgallant-sails, and get a sound with much less trouble. Again, in case of splitting sails, or, from any cause, being obliged to bend others, how easily it can be done compared with the old rig, in which it is next to impossible to bend a topsail, when you could carry one double or close-reefed!

"By omitting the cap-stay *on the main and mizzen masts*, the topgallant-sails can be set over the reefed topsails. I do not recommend omitting it from the foremast, because the sail which hoists on the fore cap-stay is too invaluable to be dispensed with. The foretop-sail, when whole, being no larger than the main one, when reefed, and the masts being equally stout as on the main, it will seldom be necessary to reef it.

"In the ship Massachusetts, coming from Liverpool, when I came in her as passenger, we had, one morning about nine o'clock, a sudden and severe squall: the ship had been under royals, jibs, and spanker, fore and main topmast studding sails, heading westerly; wind abeam on the larboard tack. About 8 A.M. squally; took in studding sails, royals (being topgallant sails of old rig,) flying jib, and spanker; 8.30, took in mizen-topgallant sail; at 9, while we were at breakfast, a sudden and dense blackness came over the before black atmosphere; the captain ran on deck, I followed instantly, and cast only one glance to windward to satisfy me that we were caught with too much canvas set. Before the order to haul up mainsail, or any other order, could be obeyed, the squall struck us: I got hold of the weather-wheel, and we just saved her from being struck aback; she fell off without losing headway, and, at the instant the sails filled, the squall was on her; the main-tack bolt parted, the mainyard flew up so suddenly acockbill as instantly to carry away the lee maintopsail sheet, and coming as a lever suddenly against the main-stay, drew out both the bolts from the bitts, thus bringing a great strain on the foremast by the upper main or 'cap-stay, and on the stays higher up;' both forestay bolts were drawn out of the knightheads, and one bobstay carried away; at the same instant the ship was hove gunwale under, and the jib and inner jib, foretopsail and topgallantsail, and everything forward, excepting the foresail, were torn to tatters, although cotton canvas, and only a few weeks bent; the maintopgallant sheets parted, and this sail and the maintopsail, with lee sheet gone, got aback, and were saved only slightly damaged; also the mizzen-topsail and mainsail. For a few moments, while I assisted the man at the wheel to keep her 'close at it,' the ship seemed to fairly fly through the water. It soon moderated to a regular gale, with confused sea. By one or two o'clock, every sail was replaced, and all right—the ship under double-reefed topsails and foresail; that is to say, whole topsails of new rig, the spare foresail bent to the mainyard, the spare maintopgallant-sail for a foretopsail, and the spare foretopgallant-sail for a mizzen-topsail. The foretopsail was entirely torn from the yard, and little of it left,—*not a spar was injured in any way.* Every man on board of that ship, at that time, felt convinced, that, had such a squall struck any other ship with whole topsails of the old rig, she would have lost her topmasts at least; and, if the lower staybolts had drawn as they did, not a stick would have been saved. There never could have been a more awful and beautiful illustration of the value of the rig. I have often seen harder squalls, but never before was caught by such a one on a wind, with so much muslin spread, and without time to get it reduced. The studding-sails, too, are more easily managed than in the old rig; the lower studding-sail can be carried longer, because the boom has not so large a topmast studding-sail to strain it.

"The mizzenmast, being nearly as long as the main, gives a useful spanker, and an excellent support to the braces of the maintopsail and topgallant-

sail, &c., which go to it, excepting one part of the topsail brace, which comes on deck.

"In fresh breezes, with all sail set, and when carrying studding sails, the braces can be more easily hauled in, for the reason that you have more levers. Three men applied to the maintopsail brace, and three to the topgallant brace, will haul the yards in easier, under these circumstances, and also in tacking, than six men could haul in the maintopsail brace in the old rig. All the booms, excepting the foretopmast-studdingsail boom, are lighter than usual in proportion to their length; also all the yards, excepting the lower yards. The topmasts, too, or topgallant masts, may be much lighter than in the old rig, say one and a half inches in diameter for a ship of 750 tons. The objections to the rig, in my mind, vanish into insignificance, when compared by those who understand it, to the many striking advantages. I will now name the objections as generally made, at first sight, and at the same time candidly state how far I think they are justified by the experience of the Edith, Massachusetts, Samoset, and Reindeer.

"*Firstly*, the increased cost. This is generally urged as the most serious objection; and, if the new rig is not an improvement, it certainly is an objection which should go far to condemn it; but I do not doubt that nine in ten seamen will admit the great advantages of the rig for stormy latitudes. If, then, this point is conceded, let me ask if any ship is constructed anywhere, for any trade, where she is not to be at some time subjected to squally, blowy weather? The Atlantic is certainly the most stormy ocean; but who that has been to China, Bombay, or Calcutta, would like to go unprovided with the best means for encountering gales, typhoons, or squalls? Who that has passed the Cape, going east or west, that would not, particularly from May to August inclusive, like to have the new rig? Who that has beat down the Bay of Bengal in the south-west monsoon—who that has left China, from June 1st to October 1st—who that has beat up to Shanghae, from October 1st to April 1st—who that has doubled Cape Horn to get into the Pacific—who that has beat up the China Sea, against the monsoon, would not be glad to have the advantages which I have recited in detail? It is generally admitted, that ships for the India trade may have more canvas than for the European trade; but is there any one who will say that he would not like to be able easily and quickly to reduce his canvas? But, as to the cost, I have consulted the spar-makers who made the Samoset's spars: they say that, being a bark,* they made her spars at the same rate as they would have made them like the old rig, had she been a ship. They also say, that they estimate the additional expense as embraced in the extra length of lower masts, and in the value of the three topsail yards, and they call this extra cost $75. I estimate the extra blacksmith's bill at $50, and for extra cost of rigger's bill, say $50 more; add to these items

* Now a ship.

more blocks, at a cost of $25, and we have the sum of $200. Now, if the advantages of the rig are not worth that sum in the first cost of a ship, they are not worth adopting.

"But the spar-maker has deducted nothing for the decreased diameter of yards and topmasts, and which I think nearly equal to the sum of $50.

"*Secondly.* The next objection is to increased weight aloft: let us examine into the extent of this. The lower masts are longer by eight feet at the head; this is counterbalanced by the reduced weight of the masts above the lower masts; there is one more yard on each mast, the extra weight of which is partly made up by the reduced diameter of all except the lower yards, by the reduced weight of the topgallant sail, which represents the upper half of the old topsail, and by the fact that the topsail yards are always lower down. The booms are all lighter than in the old rig, excepting the foretopmast-studdingsail boom, so that the effect to heel the ship is not greater than in the old rig. These arguments are used only to meet the objections of those who prefer to be light aloft; and if all ships are constructed deep and narrow, and are cotton or tea-loaded, with little ballast the objections are valid. But for iron-loaded ships, and ships with any other heavy cargo, a little additional weight aloft is, to say the least, no disadvantage. Most of the serious accidents which happen to ships at sea, in gales of wind, arise from being too laborsome, and from not being able to reduce and TO MAKE SAIL quickly. More damage to ships is done by their having too little than too much sail set. Considering, then, that the extra weight aloft is a disadvantage only to crank-ships, I ask if, in this class, it is not made up tenfold by having the power to reduce and MAKE SAIL quickly? For what is more uncomfortable than having to make and take in sail in a ship whose deck is generally at an angle of thirty degrees with the horizon?

"The masts and yards are certainly better supported, both by stays, shrouds, and backstays; and, in case of carrying away a topmast (say, topgallant-mast), you are still under double-reefed topsails, and you can much more easily and safely get up a new mast with a doubling of twenty feet than with one only ten or twelve! The reader will notice that I hardly admit of the possibility of carrying away anything below the lower cap,—and it is certainly difficult to carry away the lower mast head by any strain that can be put upon it by the topsail which hoists on the heel of the topgallant-masts. I do not say that it is not possible to meet with disaster to my rig, as in the case of the Reindeer, in a hurricane in the Pacific; but I do say that a ship with it is much less liable to lose her spars and sails, much less likely to come on the underwriters, and much more likely to command a choice of men to man her.

"But the point where my rig commends itself most to the *interests* of shipowners and sailors is in the fact, that you can do nearly as much with the watch as the ordinary ship can do with all hands. Every man who has been to Batavia, China, Calcutta, and Manilla, knows that, on leaving

those places, one third of the crew, on an average, is pulled down by dysentery, fever, and ague, and other diseases to which mariners are subject, from exposure to night-air, unwholesome drink, unripe fruits, and hard labor in stowing cargo; and it often happens, that, when the men are most reduced in strength, the time to sail is the season of gales and squalls; the ship that has my rig will then command confidence, and beat a superior sailer in getting into the trades. Capt. Hollis, of the Samoset, and Capt. Lord, of the Reindeer, assure me that they could take care of the ship in any weather without calling all hands. They sailed with a prejudice against the rig, but returned, after voyages round the world, quite satisfied with it: all they want is more canvass; for, they say, 'with this rig, we can take care of more canvas with fewer men than in the old rig;' and they use this as an argument why a ship, rigged like the Samoset or the Reindeer, may have from ten to twenty per cent. more canvas than any other. Their verdict, as well as that of Captains Wood, Goldsborough, Johnson, &c., is in favor of the new rig.

"*Thirdly*. The next objection, and the only one that I lay the least stress upon, is, that the canvas being cut up into small pieces, cannot do as much good as if in larger sheets; that, having more yards, more ropes, more corners, more interruptions to the course of the wind along the sails, the ship cannot sail as fast as with the old rig.

"Let us examine how much this *acknowledged objection* amounts to. As to 'the gaps,' the 'cutting up of the sails,' it must be remembered that the royal yard (topgallant of old rig) and the lower yard are in precisely the same places as they are in the old rig: the only additional gap for the escape of the wind is between the foot of the topgallantsails and the topsail yards. To obviate this, let the courses, or any two sails above, have a cloth more in them. Then, as to the increased corners, &c., there is a very small increase for the same reasons—and this objection only applies to 'on a wind,'—it is conceded that the sails can be more easily set and taken in, can be carried longer, and, when set, stand flatter than any others; the studdingsails can be set and taken in with more ease, and without yawing the ship off her course,—which operation, so much practised, should be prohibited by statute!

"No other objections have ever been made, unless on account of the looks; this is not worth wasting a single argument upon.

"Another word as to cost. That which is best in the long run is the cheapest; and there is no more reason to expect the best canvas, the best patent steering apparatus, the best windlass, and the best rigging, without paying an extra price for them, than to expect the cheapest captain to make the best voyage for the owners. If one-half the advantages I claim are found to exist, and all the objections discussed be admitted, the new rig, at a cost of $200 or $300 extra, is of no consequence in a ship of 750 tons, costing $50,000. If I were an underwriter, I would take a risk on a ship

fitted with the new rig certainly for a quarter, if not half, per cent. less for the China passage, or at the same rate for two European passages in the winter season; and if I were a sailor, looking for a ship for a long voyage, I would give the preference to one with the new rig of a dollar per month at the least. The rig, which I call mine, is entirely original, so far as I know, with me. It is true I have seen a ship in Boston harbor with two yards and sails on an ordinary foretopmast, and that was something like mine; and there were several ships in the East India Seas, fitted with similar sails and yards, but not arranged like mine, and having no symmetry, as I am told, for I have not seen them. Every man who has been in the British Channel and North Sea has seen schooners with a shoal topsail on the heel of the topmast, under the lower cap; but there the likeness to my rig ends. I have seen one eastern schooner with a topsail on the heel of the topmast, and a large unsightly topgallant-sail above the cap, on the topmast; but it is not a likeness of my rig.

"Naval officers have freely discussed my rig, some with an understanding eye, and others as if blindfolded. *All* admit its utility in heavy weather in a ship short-handed; and *most of them* repudiate it for men-of-war, because, as they contend, they have plenty of men to do the work, and they don't want any labor-saving 'gimcracks.' Why, in the name of common sense, then, do they lumber their ships with all sorts of contrivances for rigging out and rigging in, topping up and jumping down, jiggers for this and tackles for that? Why don't they dispense with sheaves and pins, capstan and stoppers, and do all by main strength?

"Now, although a novice in war-ships, I do contend that the rig is specially appropriate for a man-of-war, and is most appropriate in war-time, particularly with the masts fidded abaft, because in battle the damages can be much more easily repaired, and the guns more constantly and easily worked, for the reason that more men can be spared to work them. And, whether in peace or war, the large sails of ships of the line would be much more durable and much more manageable. In this opinion I am sustained by one of the most intelligent seamen in the navy, Commander L. M. Goldsborough, who was attached for fifteen months to the Massachusetts. But, as economy of money and labor is not one of the objects of the navy I shall say nothing to controvert the opinions of the many who advocate my rig as suitable only for half-manned merchant-ships. In the course of my voyage to Ireland in the Jamestown, in 1847, Capt. Macondray, who also made a passage to Liverpool in the Massachusetts, and myself, *only once* regretted that she was not rigged like the Massachusetts, and that was all the voyage. We had plenty of reefing to do; and we concurred in the opinion, that had she been so fitted, our voyage, short as it was, might have been performed in less time, with much less labor.

"It will be asked by some, why I am so desirous of recommending this peculiar rig to merchants and seamen: having no patent, and no desire for

one, I can expect no pecuniary advantage. True; but I wish to introduce it for the reason that I believe it will go far to reduce the risk and labor and anxiety of sailors, and the losses of underwriters. I do not advocate it on selfish grounds, but, as I believe, because I think it will be for the general good, and that it will essentially mitigate the sufferings of that neglected class of men, the foremost 'Jacks.' I do not recommend it specially for large ships, though I believe that the larger the ship, the more convenient it will be found. It is well adapted to coasters of all sizes.

"One word more on my rig. In conversing with some gentlemen of the navy on this subject, with my sketch before them, I found it approved for several reasons, which are not stated in the foregoing remarks. They are as follow:—

"In action, when it is often necessary to double-reef topsails, not on account of the strength of the wind, but because it is convenient to have the ship as upright as possible, in order to give the guns greater effect, my rig would be very handy to clap on more sail at once, and shoot into position; also, in case of damage to sails or spars, the repairs could be more readily made. The topsails may be disabled by shot, unbent and replaced by new ones, without lowering the topsail yards on the caps, as would be necessary in the old rig, whereby the topgallant-sails are rendered for the time useless. In short, I consider it a waste of words to endeavor to recommend it to those who cannot see its advantages after five minutes' inspection of the plan. I feel quite sure that every intelligent seaman will appreciate the rig, both for vessels of war and merchant-ships, and most particularly for whalers. It often happens, I believe, that nearly all the crew leave the whale-ship on the cry of whales in sight, 'There she spouts,' or words to that effect. All is confusion; 'down boats,' 'clew up topgallant-sails,' 'up mainsail;' and away they go, leaving the ship with everything in confusion, and only three or four men on board to bring matters into order. If the ship happen to have whole topsails set, these few men can't reef them, though they may 'clew down,' and with some effort take care of the ship; but they cannot make and take in sail handily; they cannot beat up for one boat, and bear away for another, with the same commanding canvas that they could with my rig. Suppose the ship to be under double-reefs of the old rig when the boats leave, the few men left on board cannot easily let them out and beat up to the boats, which very likely the one hundred-barrel sperm-whale may have towed several miles to windward of the ship; night is coming on, and the rich prize may be lost before the ship and whale can be secured. With my rig, the few men remaining on board can clap on the topgallant-sails, and if the wind admit, the royals, and beat to windward in one half the time, and with half the labor that would have to be expended in the ship of the old rig.

"I have said but little on the subject of rigging men-of-war and whalers

after my plan, because I do not profess to be intimately acquainted with their wants. But the more I look into it, the more am I convinced that the rig must, *sooner or later, be introduced in all ships*, large or small.

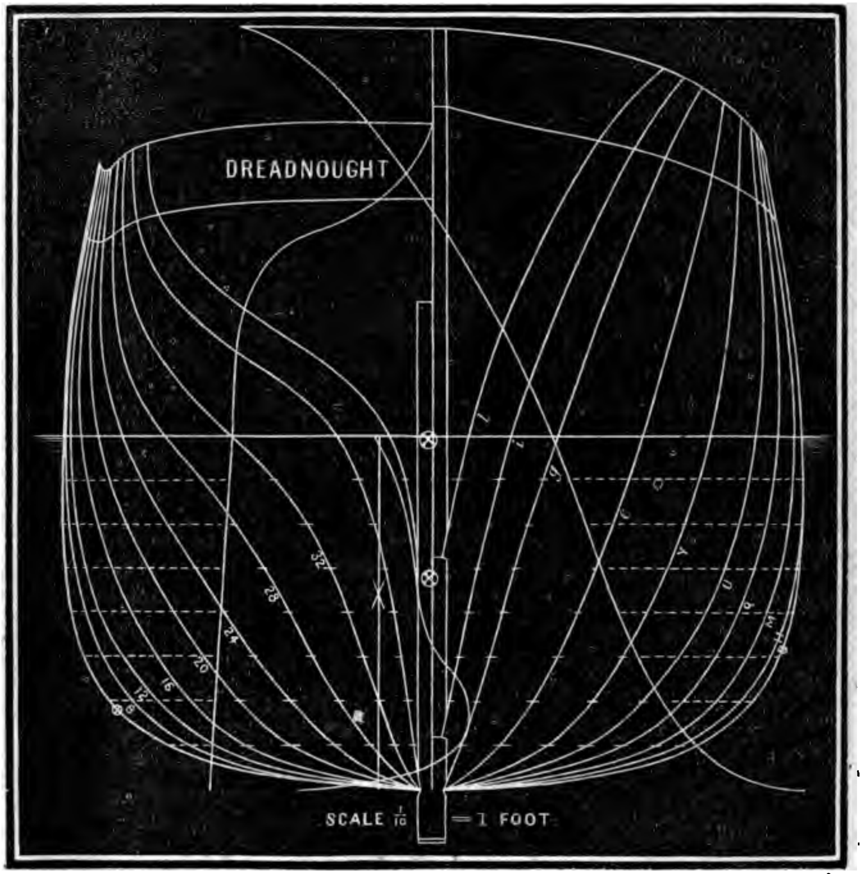
"I have to say, in conclusion, that I shall be happy to furnish plans of spars and sails to any one who may wish to adopt the rig. I shall feel well compensated for the labor, in the reflection that I have done something to lessen the hardships of sailors."

THE SEMI-CLIPPER SHIP "DREADNOUGHT."

Among the packets engaged in the Liverpool trade are to be found some of the finest ships, when their dimensions are considered, belonging to the merchants of the United States. These vessels are all built with three decks, besides a poop cabin, and the usual house accommodations upon the upper deck. In consequence of their great depth, they are unstable without ballast, and usually carry but a moderate amount of sail, or propulsory power. Owing to the defective mode of admensuration for tonnage of vessels having more decks than one, in this country, the mazes of the ship-builders' ingenuity have been threaded, time and time again, to devise a set of dimensions and model, that will carry the *most* and measure the *least*—consequently, supposed to furnish the most "profitable" ship. The desultory efforts of the old packet-builders has furnished an ample fund of practical knowledge upon the various expedients of *modelling versus admeasurement;* and the evasion of "tonnage" has long since become systematized in the hands of skillful architects. The science of packet-building is one of the most difficult branches of marine architecture, and, strange to say, has already coined its peculiar vocabulary of terms. For instance, the undue development of *depth* is estimated as a corresponding per centage for *profit* over *speed*, and the development of extraordinary carrying qualities in proportion to *dimensions*, has its significance in *burthen* over *tonnage*.

The semi-clipper ship Dreadnought was built during the summer of 1853, at the yard of Messrs. Currier & Townsend, Newburyport, Mass., for D. Ogden, Esq., of New-York. The model was made by James L. Townsend, and was designed to

embrace as large a share of qualities for speed as were possible within the arbitrary orbit of the dimensions as furnished by the owner. Her performances indicate a successful combination of the best qualities of a packet ship, with the finer realizations of clipper modelling. Some of the most famous clipper ships have failed to prove a match for the Dreadnought, under the pressure



of strong winds. We do no more than justice to her constructors when we add, that her Master, Capt. Samuels, and her owner, D. Ogden, Esq., are equally proud of their ship, and desirous to afford the world any information concerning her.

Our readers will also be gratified to see the draught of a ship which has the reputation of performing one of the quickest, if not the quickest, passage ever made by a sailing ship from New-York to Liverpool.

By the courtesies of Mr. Townsend and Mr. Ogden, we were put in possession of the duplicate *model* of the Dreadnought, from which we have made her calculations, as follows:

DIMENSIONS AND CALCULATIONS.

Length on deck,		200	feet.
Length on load line when fully laden,		190.40	"
Height of same, above base line,		18.50	"
Height of plank-sheer, above base line,		28.83	"
Depth of hold,		26	"
Breadth on load line at dead flat section,		39	"
Breadth extreme at " "		40.25	"
Weight of ship, by displacement, in tons gross,	908		
Area of loadwater line, in square feet,	5740		
Exponent of the same,	0.77		
Centre of gravity, abaft mid length,		0.12	"
Area of greatest transverse section, square feet,	642		
Exponent of the same,	0.90		
Location forward of mid-length of load line,		3.20	"
Moulded displacement in cubic feet,	80774		
Do. do. in tons gross,	2308		
Total displacement in gross tons,	2468		
Exponent of displacement,	0.57		
Centre of gravity, below load line,		7.51	"
Centre of gravity, forward of mid-length,		2.82	"
Moment of stability $(S.\ \frac{1}{3} y^3\ d.\ x.) = 582,652$.			
Height of *meta centre*, above centre of buoyancy,		7.21	"
Registered tonnage,		1,413	tons.

It will be seen from the calculations, that the Dreadnought was modelled upon the modern and more scientific principles of marine architecture, which has generally found favor at the hands of American ship-builders; and may be found systematically elucidated in Mr. Griffith's "Treatise on Marine and Naval Architecture." The greatest transverse section is located near the mid-length of vessel; the side line is convex to a considerable degree, and the termination of the water lines are concave. The modeller holds that "stability is the great *desideratum* for ships of such great depth; and if you try the

concave line *strong*, without great length, you will see a *crank* ship." We would remark, that the "strong concave line" furnishes less resistance, and greater stability, *for the same displacement.* It is true, however, that the wave principle of modelling, contemplates increased *breadth*, for the purpose of distributing the displacement upon the *sides*, rather than the *ends* of the vessel. And were *ships* measured for registry, even under no better rule than that applied to single decked vessels, or schooners, we would find less difficulty in exhibiting the advantages of concave lines, in combination with sufficient stability, without ballast, to maintain an upright position at the dock, or in the stream, without cargo on board. The secret of the whole difficulty consists in narrowing a ship's breadth to the most contracted limits, and at the same time extending the depth to the utmost margin of bare security, even to the extent of demanding *one* ton of ballast for every *ten* tons of registry, to keep the ship on her bottom. In other words, unprofitable ballast is heaped up in the hold, in order to *balance* the "profitable" topsides which are added to the ship, beyond the reach of the Custom-House Surveyor. With wheat in one end of the bag, and a stone in the other, the commercial courser groans beneath an intolerable burthen on her way to mill.

We do not hesitate to say, that if the entire depth of a ship's hold were taken, as it ought to be, if we would not make an unjust discrimination against single-decked vessels, the complex problem of furnishing "stability" to disproportionate dimensions would pass from the mould-lofts of the United States into the dark corners of the past.

The calculations will show that the Dreadnought is not furnished with a superabundance of stability—the height of *metacentre* being but 7.21 feet above the centre of bueyancy, or near four inches below the height of load line, when drawing 21½ ft. water. Consequently her builders have not been able to apportion her more than a moderate amount of propelling power, as her list of spars will prove. Their judgment in this particular has been duly honored in her performances, as but little satisfaction can ever be had from an over-sparred vessel. This consideration leads to a farther appreciation of the model, for we

find a large load line displacement, with moderate propelling power, contending successfully with sharper ships, having a larger proportion of sail, but which they could not carry so well before the driving gales.

The keel of the Dreadnought is of rock maple, sided 15, moulded 28 inches, shoe 3 inches. Keel scarphs 10 feet long, fastened with six 1 inch copper bolts, exclusive of the bolts that go through the floors, and keelsons. Timbering room and space 30 inches. She has three tiers of keelsons, 15 by 15 inches, bolted with 1⅜ and 1¼ inch iron in each timber alternately, *i. e.*, a bolt 1¼ inch copper through the floor timber and keel, and one bolt, 1⅜ iron, through keelson, floor timber, and half way into the keel. One and one quarter inch iron bolts fasten the keelson and first futtocks. The sister keelsons are bolted with 1⅛ inch iron into each timber, and also through the main keelson. The ceiling in the lower hold is from 7 to 11 inches, of yellow pine, bolted with 1 inch and ⅞ inch iron, two bolts through each timber. The lower deck clamps are 12 inches thick and 14 inches wide. Lower deck lodge and bosom knees are sided 7 inches, of white oak, moulded 16 inches at the middle of the berth, and 23 inches at the throat, bolted 1⅛ inch iron through the frame. The stanchions under the lower deck beams are oak, 10 inches square, secured amid-ships with two knees to each beam, and confined by two other knees to the keelson. The upper deck waterways are 12 by 9 inches; the first thick strakes are 14 inches square, the second 12 by 9½ inches, and the others 5 inches. The lower deck beams are 15 by 14 inches at centre; carlings 9 by 5. The middle deck waterway is 14 by 8; two thick strakes 10 by 14, the others 6 inches. Middle deck beams are 15 by 10; carlings 9 by 5½. Hanging-knees, 19 to 22 inches in the throat, moulded 14 to 13, fastened with eighteen 1 inch bolts and 4 spikes; 12 knees amidships, on each side, are oak, the others are hackmatack. The upper deck beams are 15 by 8½ inches; carlings 7 by 4½. Berth-knees, sided 5½, moulded 16 inches at throat. Upper deck hanging-knees are 17 inches at the throat, sided 9 inches, fastened with 15 bolts of ⅞ inch iron, and 4 spikes.

MASTS AND SPARS.

Stations.—Foremast, abaft of forward deck, perpendicular, 44 feet; from foremast to mainmast, 66 feet; mainmast to mizzenmast, 52 feet, and 38 feet thence to after perpendicular. This places her mainmast 13.20 feet abaft the centre of length of load line, or 10 feet abaft of the greatest transverse section.

DIMENSIONS.	FEET.	HEAD OFF.	DIAMETER.
Main mast	87	14½	35 inches.
Fore "	83	14	33 "
Mizzen "	78	11½	28 "
Main top-mast	48	8½	18 "
Fore "	47	8½	17½ "
Mizzen "	39	7	14 "
Main top-gallant	28	8½	12½ "
Fore "	27	—	12 "
Mizzen "	22	—	9½ "
Main Royal	18	—	9½ "
Fore "	17	—	9 "
Mizzen "	14	—	7½ "
Main skysail mast	12	—	— "

		DIAMETER.	YARD ARM.
Main yard	79	22	5 feet.
Topsail "	64	17	5½ "
Top-gallant "	46	11½	3½ "
Royal "	35	9	2½ "
Skysail "	25	8	2 "
Fore "	72	20	4½ "
Topsail "	58	15½	5 "
Top-gallant "	43	11	3½ "
Royal "	32	8½	2 "
Cross Jack "	60	16½	4 "
Mizen top-sail "	48	12½	4½ "
" top-gallant "	35	9	3 "
" Royal "	24	6	2 "
Bowsprit	25 outboard	30 in., steeve 4 inches to foot.	
Jib-boom	16 "	18	
Flying jib-boom	15	pole 3 feet.	

The following is the schedule of cargo taken on board the Dreadnought, on her first voyage to Liverpool:

		TONS.
3,827	Barrels of flour, weighing 215 lbs. each,	367.32
24,150	Bushels of wheat, 60 lbs. to the bushel,	646.87
12,750	Bushels of corn, 56 lbs. to the bushel,	318.75
304	Bales of cotton, weighing 132,914 lbs.,	59.33
198	Barrels of potash, weighing	58.58
150	Boxes of bacon do.	36.80
5,600	Staves, estimated at	12.00
	Weight of ballast	60.00
		1,559.65

Draught of water, 21½ feet abaft, and 21 feet forward. On the second voyage, the cargo weighed, including the 60 tons of ballast, 1,461 tons, gross.

THE CAPSIZING OF THE TROOP-SHIP PERSEVERANCE,

AT WOOLWICH DOCK, ENGLAND.

THE following ludicrous instance of ignoring science by nautical bunglers in high authority is peculiary rich, and may afford a timely hint to those whom it may concern on this side of the Atlantic. Among the many mortifications it has fallen to our lot to experience in reference to some of our own naval operations, we have hitherto escaped any such disgraceful display of ignorance regarding the stability of floating bodies. The British Admiralty deserve to be laughed at by every apprentice at ship-building. With an abundance of scientific men at their command who are competent to perform the necessary *calculations* to determine the *stability* of any given vessel, they purchase by *tonnage*, add "poops" and "forecastles" by the *story*; and when the water is let into the dock, and the shores removed, the baulky fabric "rolls leisurely over," and refuses to float "right side up!" No doubt the British engineers projected a plan of Sevastopol before undertaking the investment of that remarkable place; but the ship-builder is set to work to cut and carve, and bring his skill into disrepute, without any more regard for the investigations of science than was manifested in the days of Julius Cæsar. Why is it that so much ignorance is manifested in regard to the problems of marine architecture? How long shall it be that every art but our's shall stand upon a mathematical basis, and science be consulted upon her statutes?

The remarks of the following writer, found in the *London Mechanics' Magazine,* is well worth a perusal; and we hope they will not be lost upon the naval authorities of the United States, since they may yet be found going to sea in the same boat. We would particularly refer to his observations upon the "defects in the administration of admiralty boards," &c.

We quote as follows:—

"Of all the unanticipated spectacles brought before us since the outbreak of the present war, there probably has not been one more remarkable than that which was witnessed at the Royal Dockyard at Woolwich, *when one of Her Majesty's ships, on being floated in dock, started from her upright position, and rolled leisurely over, till her masts came down upon the ground.* Such a circumstance is of importance, not only on account of the results immediately following it, but also because it suggests considerations and excites apprehensions which greatly tend to the disquietude of the public mind. Men ask, and ask with reason, 'If the Admiralty provide us with one ship which rolls over in their own docks, and before the eyes of their own executive officers, may they not have provided, or be now providing, us with others, which, while they are staple enough to bear our regiments with safety from our harbors, may, nevertheless, pitch them out into the Bay of Biscay or the Black Sea when the first storm overtakes them? They begin to doubt whether the same fatal hand that has slain one army before Sebastopol is not likely to seize upon the elements of another on their way thither; and whether Mr. Bernal Osborne is not to be numbered among the lords of misrule, notwithstanding the boldness with which he calls upon the House of Commons to admire the perfection of his own department of the Royal service.

"Undoubtedly, when a vessel, in which a thousand British troops are about to be deposited, suddenly capsizes in still water, some ready explanation of the fact may fairly be demanded. The elucidation put forth by the Duke of Newcastle in the House of Lords, viz., that the shores were removed from the ship too soon, however effectual it may have been in silencing the interrogator of the government, is quite unfit to be entertained for a moment. Every person who has ever seen a large ship undocked in a Royal dockyard, must be perfectly well aware that the upper tier of shores (breast-shores) are allowed to remain until the vessel is fairly afloat. But even if this were not the case, and if the shores were actually removed before the water in the dock had altogether floated her, it could only be by an extraordinary combination of instability of form, and inequality in the distribution of the weights on board the vessel, that such a result could be brought about. In addition to these considerations we may add, that we have been assured by eye-witnesses of the occurrence, that nothing trans-

pired during the undocking of the *Perseverance* which could lend the smallest show of truth to the statement of the War Minister.*

"To us nothing mysterious appears to be involved in the circumstance under notice, and nothing accidental is necessary for its explanation. Those of our readers who have carefully studied the disquisitions on the science of naval architecture which have from time to time appeared in our pages, will have observed that the height of the centre of gravity of a ship always enters into the expression representing her stability in such a manner, that the stability diminishes as it increases, and *vice versa*. It is evident, therefore, that for every ship there is a maximum height, beyond which her centre of gravity cannot with safety be elevated, a given displacement and draught of water being assumed. This height is generally much less in merchant or passenger ships than in ships of war of the same tonnage; because, while the latter are expressly formed to carry great weights, such as those of guns and shot, &c., above the water-line, the former are constructed to carry the principal portions of their burdens in their holds, and but comparatively small weights upon their decks. Now, the *Perseverance* was built to carry merchandize and passengers; but having been purchased by the government for the transport of troops, she has had a poop and a forecastle added to her, and has unquestionably been furnished with much heavier masts and yards than she was originally intended to carry. By these and other additions of weight above the water-line of the vessel, she has, beyond doubt, had her stability (which was, probably, scarcely sufficient even for her original purpose) too much diminished, and the inevitable result has followed.

"It is evident, therefore, that a mistake has been made, and a costly vessel has been purchased, and appropriated by the Admiralty to a purpose for which she was quite unsuited. We know how easy a matter it would be to pursue the subject further, to show that the error committed was avoidable, and to endeavor to fix the responsibility upon those whose business it is to expend the public funds with caution and economy. But we think it more to the public interest to point out the cause from which, we believe, this and other similar evils have arisen, viz., the disproportion that exists between the staff of the Surveyor of the Navy's Department and the duties that devolve upon it, especially at a time like this, when the Admiralty profess to be putting forth the full naval strength of this great nation.

"Let any competent person consider for a moment the amount of labor that has fallen to the lot of the surveyer's department, only in these three great divisions of its duties, viz., the construction of new ships, the conversion of sailing into screw vessels, and the hire and purchase of suitable vessels for transport service! And who have there been to execute this? A post captain for surveyor, two professional assistants, (only one of whom has

* Since the above remarks were written, Admiral Berkeley has contradicted, in the House of Commons, the statement made by the Duke of Newcastle.

received a thoroughly professional education,) and some four or five draughtsmen; these latter being, in almost all cases, taken from the offices of the dockyards, never having received any further direct theoretical culture than what is abroad in the mould-lofts of those establishments, which we confidently pronounce to be but small, and to fall altogether short of that necessary for the determination of the essential qualities of ships, such as statical and dynamical stability, &c. This is the staff appointed by the Admiralty to furnish to the dockyards complete instructions for the conduct of works on which upwards of one million pounds for artificers' wages, and nearly three millions for the stores converted, are to be expended during the ensuing year! It is an incontestible fact that the government of this great maritime country, which prides itself on its skill in naval architecture, and its supremacy upon the seas, has not in its pay one individual whose undivided duty it is to perform those calculations which must necessarily be effected before the true qualities of a single ship can be determined!

"These things tend to excite inquiry once more into the attitude assumed by our naval administrators towards those who have pursued, or are pursuing, studies connected with the more theoretical branches of the science of naval architecture, and therefore into the prospects of the science itself among us. We cannot now extend our remarks upon the subject, but shall return to it hereafter. Let it suffice for the present to say, that the fatal blight—proceeding as much from stupidity as from corruption—which is now seen to have fallen upon all public departments, has descended thickly upon this. A single glance at our dockyard establishments attests the truth of this statement. The members of the first school established by the government for the improvement of naval architecture, are just now stepping, grey-headed, into leading positions, after years of systematic depreciation, while those of the late School of Mathematics and Naval Construction, whether meritorious or otherwise, are tossing about in the most humiliating positions that can be found for them, and are subjected to frequent indignities, from which an arduous and extended course of mental culture should at all times be a protection.

"We have hinted in our previous remarks at only a few of the defects in the administration of Admiralty Boards in connection with our dockyard establishments. But, as we write, innumerable others rise up before us, and claim our future consideration. Among these are the paralyzing influences which result from the placing of the mechanical departments of the dockyard under the control of captain and admiral superintendents—an arrangement by which the plans and orders of well-informed professional officers are daily annulled by the mere caprices of men who are commissioned with authority to dictate even where they are incompetent to advise, and to adjudicate on matters of which they are necessarily ignorant:—The modern system of promotion through the various grades of office, which system, while it certainly opens up a readier way to preferment for deserving

persons, at the same time opposes but an inconsiderable barrier to the progress of incompetent but favored candidates for advancement, often conferring the prize upon one who, though without skill in h's profession, scrambles through a meagre examination in the most elementary mathematics, and withholding it from another whose abilities and experience commend him to office :—And the vast outlay that has been made in attempts to introduce and perfect a method by which the wages of the workpeople employed are apportioned according to a system of measurement, which is, after all, a most costly and inefficient system, and one which, as we are prepared to show, is productive of evils which cannot be too strongly condemned. These we shall hereafter consider, and endeavor to throw much light upon.

"Meanwhile we content ourselves with suggesting, that the accident with the *Perseverance* plainly calls for the adoption of measures which shall enable the Surveyor of the Navy's department to be more efficiently conducted. Why should there not be persons appointed not only to examine the qualities of those vessels which the admiralty require for present emergencies, but to ascertain and record the qualities of so much of the mercantile navy as is likely to be required at any future time for extraordinary service? For a most insignificant annual sum the admiralty might constantly supply themselves with this information, and thus prepare themselves for the exigencies to which a great State is continually liable."

THE SPIRIT OF THE AGE, AND ITS INFLUENCE UPON ART.

If there is one truth more than another impressed upon the thoughtful mind in regard to the present altitude of human progress, it is this: the spirit of the age is characterized by a comparatively enlightened, generous, and noble sentiment of universal benignity, prevailing in every profession, trade, and calling, amongst men. With the unfolding of science, and the closer contact of man with nature, through the unveiling of the sublime, expanding truths of the universe, comes forth a spirit of wisdom, of greatness, and magnanimity, inspiring the human breast with kindred emotions. The philosopher, sage, or mechanic, who has drank deepest at the fountain of genius, most palpably reflects the healthy glow of the refreshing draught, and breathes the purest atmosphere of intellectual fraternity among his fellows. The slavish fetters of exclusiveness, the black mantle of arrogance, the icy hand of prejudice, alike disappear in the genial sunshine of science. How should it be otherwise? The

great Architect of all, abounding in wisdom, goodness, and greatness, has indelibly stamped his handiwork with a corresponding spirit, in order that the children of earth might expand their sentiments in due proportion as they increased their knowledge. Ignorance and bigotry fly hand in hand before the march of true intellectual culture. The dark barbarian mind may well be pardoned for its selfish vision of men and things; but for the skillful artisan who fain would hide his torch beneath a *bushel* lest it should add to the general illumination of art, to expect the sympathy of mankind, is strangely inconsistent.

In every other science or profession than ship-building, the day has long gone by when the superstitious student or professor could make any pretensions to cherishing just principles of professional rectitude while borrowing the light of others, but concealing his own. It is now universally recognized by the medical and some other noble professions, as a rule of conduct binding in honor and in justice, that the student who has become indebted to the experiments, researches, and investigations of the noble minds that have preceded him, shall in turn acquaint the world with the facts of his own experience and learning, through the agency of the *press*, in order to pay the *interest* upon the vast fund of instruction which their industry had gathered for his use, and to which he must ever be, in a large measure, indebted, notwithstanding his own abilities, for his professional success through life. The *principal* of this debt the modern student can never pay, even by the aid of the most splendid talents. Let him not, therefore, repudiate the *interest*.

Shall it be otherwise with ship-builders? Shall the constructors of the most mighty trophies of mechanical art fade into nothingness by contumaciously burying the treasures of their individual experiences? We trust that the time has come when the profession to which it is our pride to belong will not be content longer to rest confined to the slow, partial, and uncertain developments of knowledge, which are the necessary consequences of remaining restricted within the bounds of an *ever-commencing, ever-repeating, because never communicated, experience*. It is but too plainly manifest that, without the pen and press, we, as a profession, *have no fulcrum for improvement*.

Beyond the brief margin of individual experience, and the intuitive suggestions of genius, the science of ship-building has hitherto rested upon no firmer foundation than the changing globules of time's passing stream. Through the want of a press, the toils of laborious induction and hard-earned wisdom in the yard and on deck have been lost to mankind. They fade, forgotten in the closets of human memory, and, unknown and unappreciated, die with the brain that impelled a daring navigator or a skillful mechanic. Truth, that is every man's inheritance, to-day is born, to-morrow perishes, if no record appears on the scientific page teaching future inquirers the intrinsic qualities of departed genius.

By the aid of the press, the least important, and the feeblest profession within the orbit of industry, has been exalted before the public eye; while marine architecture and its sister sciences, embracing a manufacturing interest of greater magnitude than any other in the United States, without a journal, has been ignored as a science, eclipsed as a profession, and obscured as an art. We live in an age when the pencil, pen, and press, are expected to *represent* the intelligence, the dignity, and the comparative worth of every useful art and science.

Relying upon the lively intelligence and generous appreciation of the maritime fraternity, the proprietors of the NAUTICAL MAGAZINE have not hesitated to launch forth upon the enterprise of *furnishing* a medium of literature, open alike to all, and to which all are invited to contribute from the ample treasures of experience. In the exercise of a laudable ambition to render some service to the noble profession to which we have belonged from childhood, deriving our partiality for its hardy labors from our fathers, it is sometimes our fortune to approach the breakers of exclusiveness, or fall off upon the lee shores of prejudice. A late adventure of this kind has furnished the occasion for the above remarks; and we propose to subjoin the arguments of our correspondent, refusing to furnish us the "tables" of a fine clipper-ship, whose performances entitled her to a place in maritime literature.

He writes as follows:—

"Has the good time come, when all have become willing to

give in the mould-loft tables of ships that have proved good? In New-York it was not so in years past. Mechanics, when I ground my *axe* there, kept all mould-loft tables, and, in fact, all information on the mysteries of ship-building, a ***sealed book;*** and I think a well-known author* on the science of ship-building must have mentally approved of the plan when he wrote the following: 'The mechanic may spend the flower of his youth, he may waste the vigor of manhood, in maturing from experience, as well as from the laws of commercial science, the synthetical composition of the perfect ship—he makes known his improvements, the world is benefited, and he dies, forgotten as a dream.' It may be that I do not appreciate your motive for wanting the tables; if not, I hope you will excuse me for withholding them."

We do most certainly think that the time *has* come to "give in the mould-loft tables of ships that have proved good;" and so far as the author above mentioned is concerned, it is sufficient to say, that his works on marine architecture give ample proof of his desire to lay the best information which he could command before the ship-building fraternity, not only in regard to building, but in modelling ships; and by his pen and pencil he has given to the profession the draughts of a few of the finest vessels in the United States, with their analysis. It may ***truly be said*** of him that he has taught more upon the subject of draughting and modelling than any other man in the country. The obvious meaning of his remarks quoted by our correspondent, who, no doubt, *had his treatise before him*, has not been understood. There is no difficulty in obtaining the draught of the finest steam-engines, and why should there be of the finest ships? Why not close the ship-yard to spectators, if the world is to be shut out from a view of the lines of a ship? Who is there with a mechanical eye that cannot embody at a glance any important modification of model, and reproduce it in the next model he makes? What ship-builder does not unconsciously do this very thing from year to year? And again, what builder has yet made a model he did not wish to alter, or that his brethren of the

* **John W. Griffiths, senior editor of NAUTICAL MAGAZINE.**

profession would not each desire to improve, were they to be required to furnish a vessel from the same? The finest vessels ever yet launched in America have been built above ground, in daylight, and their models have either been exhibited at fairs or in counting-rooms. A model must, indeed, be something very fine if it cannot be looked at. And the same may be said of the draught. There are hundreds of builders in the United States who are abundantly competent to make their own draughts and models, and would be too proud to adopt any man's, even if it answered the dimensions they required. Besides, there are few who have undertaken the responsibilities of a ship-builder who are not indebted to their brethren of the profession for some of the hints that have advanced them to their present proud position. Who ever knew real *genius* to go through the world unaccompanied by *magnanimity?* And any other is incompetent to represent the true spirit of the age, or confer a salutary impetus upon unfolding art.

BATES.

FRENCH SCREW STEAMER LAROMIGUERE, AND MASKELL'S SLIDE KEEL.

On the ninth of February last, at half-past four in the afternoon, a numerous crowd of Parisians assembled on the Pont Royal and the quay to examine the steamers which had just shot under the bridge of La Concorde. The first was quite a small craft—the Omnibus—launched at Havre, and intended to ply between Choisy le Roi and Asnieres, on the Seine. In two trial trips between Honfleur and Havre, this pretty little boat displayed the most excellent qualities of model and machinery. The second, remarkable for its size, was the Laromiguere, arriving from Bordeaux with more than 400 tons of merchandize. Built to sail under canvas or steam, the Laromiguere has three masts, made to lower and hoist, and a screw machine of 150 horse-power, operating by means of two boilers. The stern and bow are of advantageous form, the hull of wood, and all the inner parts of iron. Her appearance is striking, from its strength and

solidity; her length is about 216 feet; her breadth, 33 feet, which gives her deck a considerable extent; and when deeply laden, her draught is not more than 6 feet. By the employment of such vessels, Paris, in spite of the shallowness of the Seine, will become a seaport, an object of the highest commercial importance. The Laromiguere has a movable keel, by means of which she is rendered an efficient seaboat, notwithstanding her light draught of water. She left Bordeaux during a blow, and is said to have behaved admirably in a heavy seaway. Her masts were lowered at Rouen, to enable her to pass under the numerous bridges, and were not hoisted again until she was moored at the pier.

The movable keel referred to in the steamer Laromiguere is that of Maskell's Patent Toggle Joint Keel. The introduction of some device, by the means of which keel-vessels, of easy draught of water, could secure a sufficient amount of lateral resistance, without sacrificing strength, (as is commonly done,) by the insertion of the centre-board trunk, has long been a desired object with those engaged in such branches of the coasting trade, as it is particularly dangerous to other than vessels of the most limited draught of water; hence any means by which the lateral resistance of vessels can be increased without increasing the draught of water, will be received with favor by commercial men.

Mr. Thomas Maskell, of Franklin, La., has invented a mode of increasing the lateral resistance of vessels by means of a slide keel, nearly equal to the depth of the main keel, which may be raised or dropped at pleasure without detention, and without interference either with the capacity for stowage or with the strength of the vessel. The annexed page of engravings shows this addition of keel in two positions—the one when drawn up within the recess within the keel, the other, when the additional section is lowered to the fullest depth. The slide or toggle-joint keel may be adapted to good advantage on a vessel having a main keel of about 14 inches sided, by about 24 inches deep. The well or groove should extend from mast to mast, or from the foremast to the mainmast, of the same depth, in vessels of two masts, and should be about 3 inches transversely by about 18 inches verti-

cally. From thence to its connection near the extremities of the keel the depth will be gradually reduced, as shown by the dotted line in the engraving. The slide is designed to be about 2 inches thick, of iron, and maintains a parallel line to that of the keel, whether drawn up or lowered. The rods, by which the slide is raised up or lowered, may pass through an iron pipe inserted in the hole in the keelson, the pipe serving also as a stanchion. Under a beam immediately aft of the mast the slide is raised and lowered by means of a ratchet-wheel.

For further information apply to Thomas Maskell, Esq., Franklin, Louisiana.

THE ABERDEEN CLIPPER-SHIP CHRYSOLITE.

It will be remembered, that, in the autumn of 1852, no little excitement was created among commercial classes on account of a *challenge* given by the "American Navigation Club" to British ship-owners, offering a prize of £10,000 to the winning vessel, an American ship against a British one, of 1,200 tons burthen, to run from London to China, and back. After standing open thirty days without being accepted, the Club proposed to augment the stakes to £20,000, and extended the period for accepting the challenge, offering also to give the British ship fourteen days of a start. This challenge has never been taken up, although it had been claimed by British writers that the science of ship-building was better understood by English than American builders.

It will be but fair to add, that many of the fastest British clippers were smaller vessels than those would be which the "Navigation Club" proposed in the challenge. But while the Boston challenge was under discussion, a similar race took place from Canton to Liverpool and Deal, which was at first claimed for the British clippers, inasmuch as they *arrived first* in England. But it turned out that they had *sailed* eleven days before the American ships.

The contesting ships on this occasion were the British Aber-

deen-built clippers "CHRYSOLITE" and Stornaway, and the American clippers Race Horse, Surprise, and Challenge.

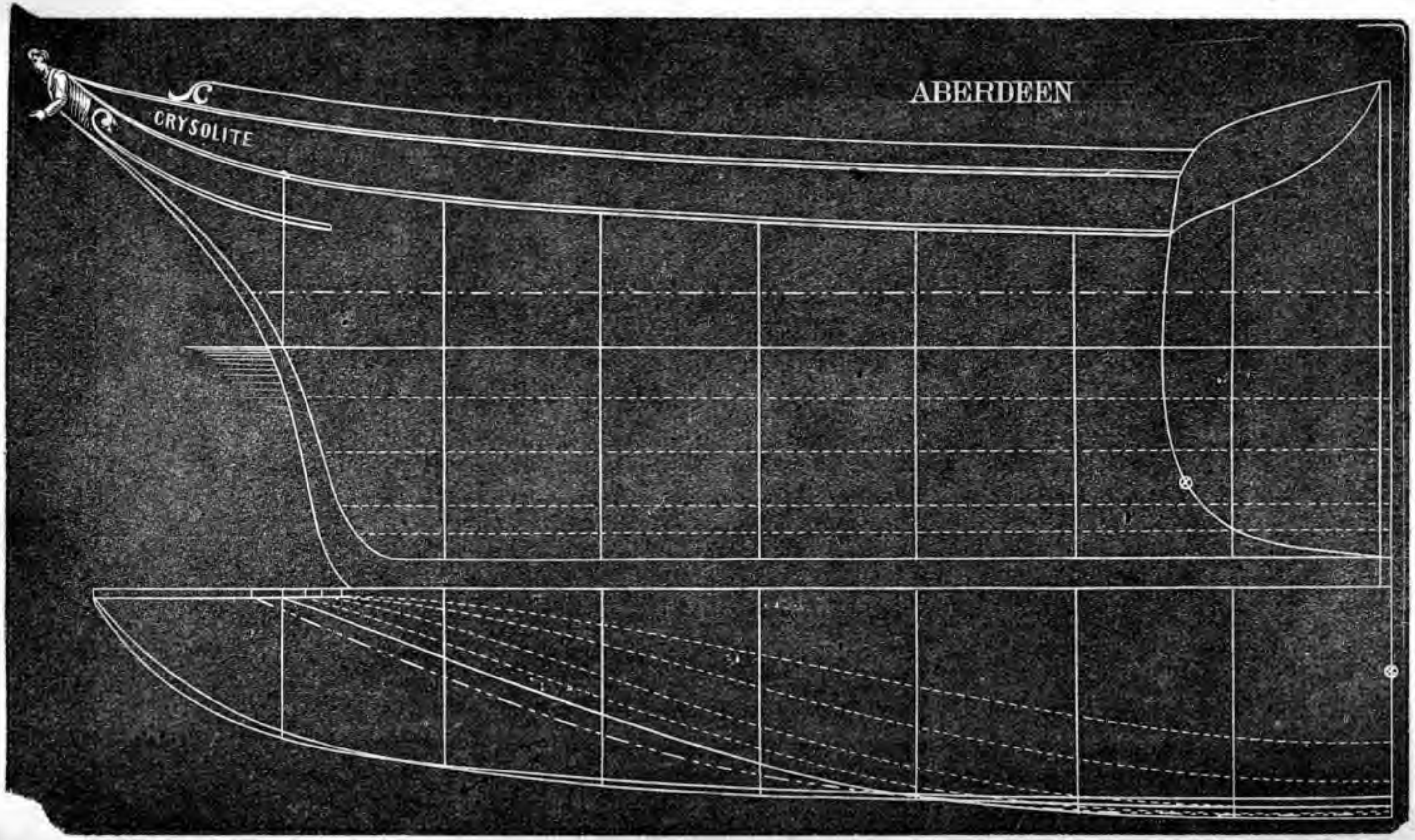
Contented to inquire no further in relation to this race, the British press determined that it was enough to know that their vessels had arrived *first* in dock; and no little gratification was experienced at this result, especially in view of the unenviable position they felt constrained to occupy at the instance of our Yankee friends. The following is the account of the match :—

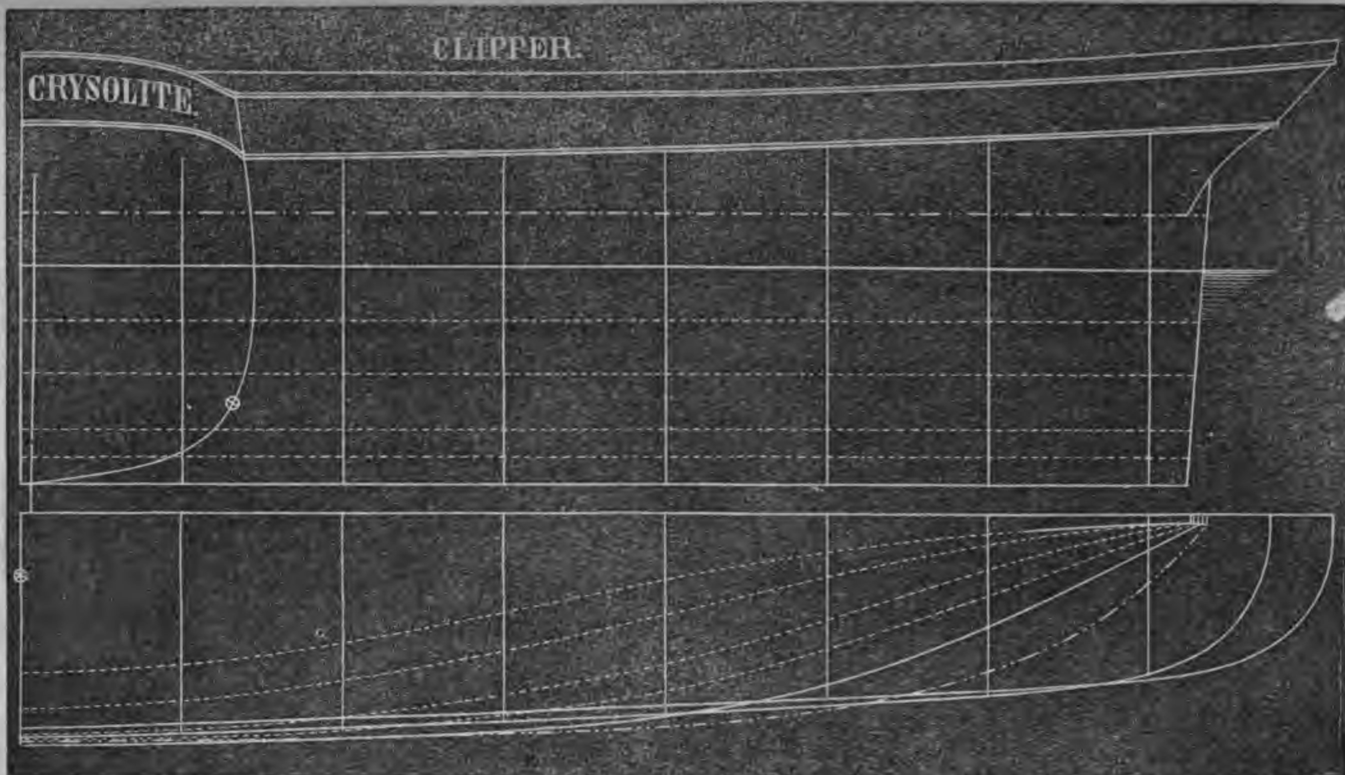
	Days.
Aberdeen ship Chrysolite, Canton to Liverpool	106
American ship Challenge, Canton to Deal	105
Aberdeen ship Stornaway, Canton to Deal	109
American ship Surprise, Canton to Deal	106
British ship Challenge, Shanghai to Deal	113
American ship Nightingale, Shanghai to Deal	110

We have published a splendid lithograph of the latter ship in Vol. I., No. 5; and in the accompanying plates we show the "lines" of the famous little Aberdeen clipper, Chrysolite, which appears to be as fast as many of our own vessels of the same denomination. Through the enterprise of a New-York ship-owner, D. Ogden, Esq., the draught of this vessel was procured, and a model made from it, which may be found at that gentleman's office, Beaver-street, New-York. Owing to his politeness, we have been enabled to present this vessel to the readers of the NAUTICAL MAGAZINE, in order to gratify a laudable curiosity to *see* what can be done on the banks of the Clyde, in Scotland, where the finest work is done by the nautical architects of Great Britain. So far as the sailing qualities of British ships are concerned, we suppose many of their finest performers are built in Canada and New-Brunswick. The *Marco Polo*, built in St. Johns, N. B., has established a fame, which is world-wide, as a clipper-ship.

We have made the following calculations of the "Chrysolite:"

	Feet.
Length on load-line for calculations	121.25
Height of same above base-line	13.33
Height of plank-sheer above base-line	17.25
Breadth on load-line at dead-flat	24.60
Breadth extreme at ditto	25.50


ABERDEEN
CRYSOLITE


CLIPPER.
CRYSOLITE.

	Feet.
Area of load-water section, in square feet.......2250.	
Exponent of the same, A÷ (L. × B.).............0.75	
Centre of gravity of same abaft mid-length..........	1.47
Area of greatest transverse section, in sq. feet.....281	
Exponent of the same, A÷ (B. × H.)..........0.85	
Location forward of mid-length on load-line........	1.63
Moulded displacement, in cubic feet..........20200.	
Moulded displacement, in gross tons..........577.14	
Exponent of displacement C÷ (L. × B. × H.)..0.508	
Centre of gravity of same below load-line..........	5.48
Centre of gravity of same forward of mid-length......	0.15
Moment of stability ($S \frac{1}{3} y^3 dx$)..........85820.76	
Height of *meta centre* above centre of buoyancy......	4.25

It will be seen that the Chrysolite is a very sharp ship, even at her enormous draught of water, and depends upon ballast or cargo for a large amount of artificial stability. Although a fine performer in favorable weather, she is overburthened with *depth*, and must needs be *tender* in a gale, when the time for speed is lost for the want of a capacious *bottom*. She resembles many of our American ships in point of model. We presume she is not tauntly sparred, her fine length being favorable to a large spread of canvas, without going aloft for sail room.

CUBICAL MEASUREMENT FOR VESSELS.

We are gratified to learn that, in the commercial department of civilization, light and motion is beginning to be felt in the Old World; the genial influence of commerce is melting down the prejudices of darker ages in the crucible of truth; and that the world will be permitted to learn, within the present century, that its commercial interests have been invaded by legislative enactments; that the commerce of the whole world has been under the surveillance of the strictest blockade from the first induction of commercial law down to the present time. But what must be the feelings of ship-builders, merchants, and mariners, when they learn that the laws of England for the measurement of vessels have undergone a second change within twenty years. Neither the characteristic genius nor the indomitable energy of the American character will long be able to give superiority to

American models with this fearful odds against us, unless, as we propose to do—*cast the old tonnage laws, as the mariners of Joppa did Jonah, out of the ship,* and let every vessel be built by good dimensions, and measured under a protest, to be sent, through the government, to Congress. If this course were adopted, the days of fogyism in ship-building would be numbered, and America, like England, would have a code of laws for the measurement of vessels, based on the best of all laws—*common sense.*

A few extracts from a friend and correspondent in London, who has studied this subject, doubtless, more than any man in Europe, will serve to show how careful England has been to give a healthy tone to every interest which has an intimate relation to commerce, well knowing its intrinsic worth. But not only is England careful to secure the legitimate fruits of maritime commerce, but to do it by the most direct means. Hence we find such men are selected for the accomplishment of a particular object as are the most renowned for a thorough acquaintance of that department of knowledge over which they are called to preside, and not because of their inauguration or induction into the ranks of a particular party, whose belief in some particular political creed is the only qualification they can bring to the honors conferred. We have known a difference of from 15 to 20 tons in the measurement of the same vessel by two surveyors at the same port, and without the slighest change in the vessel. From the letter referred to, which is an answer to one of January 31, 1855, from the office of the NAUTICAL MAGAZINE, the writer says:—

"You speak as fairly and reasonably on the tonnage question as the seekers after truth could require. The fact is, I think, that we both may be right. The circumstances and trade of America may require the principle of displacement for the basis of their law, while those of Great Britain may be better served by the principle of capacity. Our merchants, underwriters, ship-owners, and ship-builders, all called loudly for capacity. The government required reports on the question from all the principal ports in the kingdom, as well as from the leading maritime associations of the country; and at last, upon the fullest consideration, founded on these data, capacity was decreed to be the foundation of our law, and the government accordingly introduced a new system of measurement at the last session of

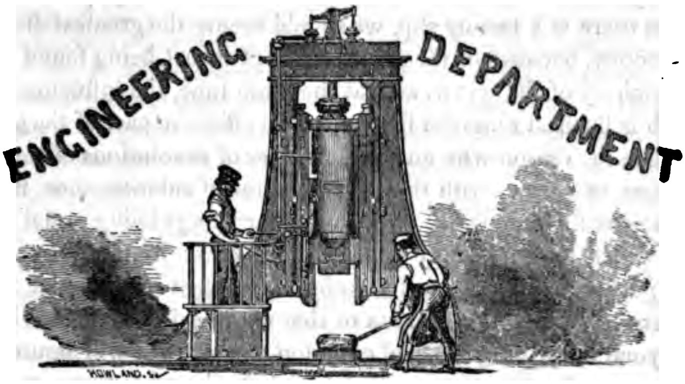
Parliament, founded on the rules set forth in my review of the laws of tonnage, a copy of which I sent you at the origin of our correspondence in 1853. The government have entrusted me with the necessary arrangements to be prepared for the commencement of the operations of this new law on the 1st of May next. I need only repeat, that the whole internal space of the ship which may be made available for profit, either by means of cargo or passengers, is considered the proper basis for assessment, and the fairest that can be devised between ship-owner and ship-owner. For instance, one ship-owner will hamper a ship with all manner of deck-houses, to the manifest danger of the vessel, while another, of better feeling, would condemn it. Our new law will tax the former for his grasping improprieties, while it amounts to a negative justice to the latter. I will, simply, now observe, that the new tonnage of this country will be what may be termed a *cubical tonnage*, every ton of which will represent 100 cubic feet. As you may judge, I am at present greatly occupied, and fear I shall be a very uninteresting correspondent.

"Most truly yours,

"GEORGE MOORSOM.

"HER MAJESTY'S CUSTOMS,
"LONDON, 22*d Feb.*, 1855."

THE FRENCH FLOATING BATTERIES.—The following, says the *Courrier du Havre*, is a correct description of one of the floating batteries, called the Devastation, now in course of construction at Cherbourg:—As the object is to make it capable of resisting the most furious fire, no attempt has been made to gain beauty at the expense of solidity, and the consequence is that, in appearance, it is very like the huge barges which ply on the Seine between Havre and Rouen. It is entirely flat-bottomed, so as to draw but little water, even after receiving heavy artillery. It is 51 yards long and 14 wide, and will be armed with 16 guns of 50. Its sides are of the extraordinary thickness of nearly 13 inches, and they are to be covered with sheets of iron nearly four inches thick. The ribs are from 13¾ to 15¾ inches thick, and are placed very close together. The battery will be supplied with a screw of 150 horse-power, and will be covered over. Its powers of destruction will be very formidable; it will, in fact, be a floating fort.



SCREW PROPULSION.

That screw propulsion, as at present applied to vessels, is radically wrong, cannot long admit of a doubt to the mind unshackled by prejudice, and to the judgment of that man whose interest does not weld him to custom. It is often found to be an easy matter to reconcile difficulties in one's own mind in almost any department of science, when the problem for solution occupies one end of the beam and dollars the other. This is emphatically true in all kinds of propulsory power, whether on the common, the plank, or the railroad; but commends itself with much greater force to the mind when applied to the fluid highway of commerce. We have always, as our writings will bear testimony, been on the side of those who advocate a screw of large diameter for propelling vessels, and that it should by all means be completely submerged; but we have learned not only that we were wrong, but that this is a popular *error* at the present time. It has been taken for granted, that whatever proportion of the screw was emerged, that part was a direct loss of propulsory power; and this theory has been sustained by the fact, that screw vessels run about as fast loaded as they do light—a truth of the greatest significance when submerged propulsion is considered. If there were no slip to the fluid nut, (for such the water proves to be,) then the same number of revolutions of a given diameter would drive the vessel at a given speed, whether par-

tially or wholly submerged; hence for the very plain reason, that there is a loss by slip, we should secure the greatest diameter of screw, because of the greatest direct thrust being found at the periphery of the screw, and, at the same time, the influence of the hub is farthest removed from the most effective part of the screw: hence the reason why an equal number of revolutions of the large wheel or screw, with the same amount of submergence, is most efficient for propulsory purposes, other things being equal. But in order that this may appear quite clear to the most obtuse mind, we will endeavor to clothe the subject in the most simple garb—stripping the formula of that complexity which has kept it beyond the willing grasp of common minds. We will assume that two vessels of the same model and displacement are provided with screw propellers, the one of 10 feet diameter, the other of 15 feet diameter, each having 10 feet submergence, with engines of the same size, and boilers furnishing a given pressure of steam. By computing the submerged circumference, we find that of the 10 feet wheel to be 31.37 feet, while that of 15 feet diameter is equal to 28.5 feet. Now, let these be multiplied by their respective semi-diameters, and we have for the 10 feet screw 156.85 feet, and for the 15 feet screw 213.75 feet. Here, in the first example, the large screw is shown to possess the advantage, with the same amount of submergence. But again, let the two screws be raised, each 2.5 feet, making the dip 7.5 feet, it will now be found that the large screw has only one-half of its diameter submerged, equal to a circumference of 23.5 feet, which, multiplied by half the diameter, gives 176.25 feet. The smaller screw has now .75, or three-quarters of its diameter submerged, which gives a circumference of 21 feet, which, multiplied by half the diameter, equals 105 feet. Here we find the greater efficiency, not only on the side of the larger screw, but in greater proportion than when the smaller wheel was wholly submerged. We shall again assume the two screws to be raised 2.5 feet higher, when we shall find that the larger one has a submerged circumference of 18.17 feet, and the smaller one of 15.68 feet. Let each be multiplied by their respective semi-diameters, and we have for the larger screw 136.275 feet, and for the smaller one 78.4 feet, or something more than half. But we will

lift them once more 2.5 feet, and we shall have the larger screw $\frac{5}{8}$ of its diameter out of water, with only $\frac{1}{8}$ dip, and the smaller one $\frac{3}{4}$ of its diameter out of water, and only $\frac{1}{4}$ dip. We have now for the large screw a submerged circumference of 12.33 feet, which, multiplied by the semi-diameter, gives 92.475 feet; and the smaller one has a submerged circumference of 10.5 feet, which, multiplied by its semi-diameter, gives 52.5 feet. Thus we have shown, in the most expressive characters, the advantage of large screws for marine propulsion over smaller ones; and we have not only shown by unmistakable characters, but we may also learn, that this advantage increased as the dip was reduced; for in the first example we find, that while the smaller wheel had an exponent of 156 in round numbers, the larger had 213, or the smaller one had about 26 per cent. less effective travel, with an equal number of revolutions; and we find by the last example that the difference in favor of the large wheel has increased to 43 per cent. But we have only shown the most favorable side of the question. In order to test this question fairly, the shaft should be the fixed point, and not the dip of the screw; and if this were so, where would the small screw have been in the last example? Why, out of water—working at zero, while the larger screw would be doing efficient service. Who would think of the complete submergence of the paddle-wheel? No sane man, surely. And yet the same principle is partially developed in the entire submergence of the screw—the only difference is, the arms are set so as to bring the paddle at an angle with the shaft, for the purpose of securing propulsory power. The shaft, hub, and arms, are a great drawback in the screw as well as in the wheel, for the screw is but a compound paddle-wheel, in the strictest sense. If we were to inquire what parts of the screw are the most effective, we should at once be told those of the outer surface of the blade. Then we say, why not use the outer surface of the blade only? Why use the hub, shaft, and arms, to detract from the efficiency of the outer part of the blade, by disturbing the fluid in the immediate vicinity? We say, that the only reason that can be assigned why the wheel or screw should be submerged, may be found in the fact, that it is more secure from the effects of *shot* where it is, and where it must of

necessity be used as an auxiliary power. But what has com merce to do with providing for a protective or an aggressive warfare? We might, with much more propriety, carry an armament to protect the vessel itself. All experience as well as science goes to prove, that the wheel of large diameter, with moderate dip, or with a dip commensurate with the power, is the best and most efficient. And if, as we have said, the screw is but a compound wheel, why is there not equal propriety in applying the same rule to the screw? But with regard to the objections to its application in the manner we have proposed, the most that can possibly be feared is the influence to veer the vessel from the line of her course, when made beyond a just medium in diameter. But again, what sensible man would place, instead of two paddle-wheels, one on each side of the boat, *one* only, and that on the stern, provided circumstances did not prevent him from having the two? And if the stern is not the place for the wheel, why should it be for the screw, aside from the danger of rending the post and after part of the vessel by applying the power at the end? By this mode of reasoning we arrive at the conclusion, that if the screw operates best with a partial submergence, the sides of a vessel is the proper place for their application; and that not only one on each side may be used to the best advantage, but that several may be used to a greater advantage, and without interfering with each other, and thus high speed may be attained. For economy in expense, or for towing, we know that the screw has advantages the paddle-wheel does not possess; and it only remains to secure its best position, and increase the number of revolutions, by direct action, to secure high speed. We say, then, in order to secure *greater safety and greater speed* in vessels, as well as *greater profit*, make the vessel a life-boat by longitudinal and transverse iron bulk-heads, and apply the *screw wheels* to the *sides* of all vessels propelled by steam.

ENGINES AND PERFORMANCES OF THE BRITISH SCREW STEAMSHIP "CANDIA."

From the March number of the London Artizan, we obtain the following account of one of the finest screw vessels of Great Britain, where screw steamship propulsion has attained a degree of perfection corresponding to the quiet and unobtrusive performances of our own light draught propellers on our great inland lakes :—

The engines are vertical geared engines; the peculiarity of them being the hollow piston-rod or trunk, and the general arrangement. There are two cylinders, with a condenser and air-pump to each. The headstock is supported by eight columns, keyed on bosses cast on the cylinders. The air-pumps are between the cylinders. The two pumps are worked by the intermediate crank. The feed and bilge-pumps are together, and worked by sway-beams connected to a rod worked by an eccentric. The pump-rods are so made as to be easily disconnected from the engines. The main connecting rods vibrate in the trunks, and are connected to the piston by means of a pin in the end of the rod, working in plummer blocks fixed on the piston. This arrangement dispenses with any other guides except the cylinder itself—brings the main shaft near to the cylinders, without the disadvantage of a short connecting-rod, which in geared engines is a great desideratum—dispenses with heavy parts, moving as in oscillating engines, and there are few parts combined with simplicity of workmanship.

The following are the main particulars of the engines :—

Nominal power, 450 horses.
Diameter of cylinders, 75 inches, equivalent to 70¾ inches diameter.
Length of stroke, 4 feet.
Calculated number of revolutions, 34 per minute.

The dimensions of the vessel are as follows :—

Length, 281 feet.
Breadth, 40 feet.
Depth, 29 feet, 6¾ inches.
Tonnage, 2,200 tons, old measurement.

The trial of the *Candia* took place on May 31st, 1854; at that

time she drew 18 feet, 7 inches, mean draft, of water, and her speed was found to be 12.7 knots, or 14.65 statute miles per hour.

She made 36 revolutions per minute. Her first trip was to Alexandria and back. On her return she was tried again. At 19 feet, 3 inches draft aft, and 18 feet, 6 inches forward, she made an average speed of 12 knots; but the trial being merely to test the efficiency of the vessel, the engines only made 33 revolutions per minute, instead of 36, as in the former trial. The indicative power was 1,356 horses; the displacement of the vessel being 2,520 tons. Referring to Mr. Atherton's Steamship *Capability*, and adopting the same formula, viz: $\frac{v.\ 3,\ \text{dispt.}\ 2\text{-}3,}{\text{H. P.}}$ where H. P. $= \frac{p.\ v.}{132{,}000},$ it is found that the index number of the *Candia* is 934, being 72 higher than the *Rattler*, which is classed first in his list. If, therefore, his formula be correct, the capabilities of the *Candia* are greater than those of any other screw vessel of Great Britain.

The *Candia's* next trip was to Gibraltar, along the coast; touching at Vigo, Lisbon, Cadiz, &c.; but as her speed was not in accordance with the prescribed time, the trip was adjudged no test of her speed except for short runs. However, on Thursday, 30th of August, after leaving Vigo Bay, making 35 revolutions, with fore and aft sails close-hauled, she made 13½ knots per log. On Friday, 1st of September, her average speed, per distance on chart, from Cape Seliris to the Berlings, was 11.4 knots, and making 30 revolutions per minute, vacuum 27 and 27½ inches; Saturday, 2nd, she passed Port Espechel at 10 hours, 55 minutes, and Cape St. Vincent, 6 hours; being 7 hours, 5 minutes, the distance being 84 miles, giving an average speed of 12 knots, very nearly.

In October the *Candia* made a first-rate trip to Alexandria and back to Southampton, and made the run from Malta to Alexandria, a distance of 820 miles, in 69 hours, with a strong head-wind against her for 20 hours, giving an average speed of 12 knots per hour. Considering that the distance run over was most likely more than 820 miles from variations of course, the performance is thought to be the best between those two ports on record.

The engines of the *Candia* were built by Messrs. G. Rennie & Co.

WHITTAKER'S SUBSTITUTION OF SIDE SCREW FOR THE PADDLE-WHEEL.

THE entire success of the steamer Baltic since the removal of the side paddle-wheels, and the substitution of screws, having more fully come within our reach since our last issue, we propose to furnish the facts relative to her former engine and those now on board, in connection with the certificates of the engineers; and we think this collective testimony will serve to prove the truth of our remarks on screw propulsion. The engine taken out of the Baltic had a cylinder of $35\frac{5}{8}$ diameter, with 8 feet of stroke, equal to 55.4 cubic feet. She now has two cylinders of 26 inch diameter, and 3 feet stroke, equal to 11.06 cubic feet each, or 22.12 cubic feet in both—about 40 per cent. (with the same pressure of steam) of her former power. But notwithstanding this great diminution of power, her performance has improved, consequent upon the double advantage of the application of the power and the mode of propulsion. A model of this new application can be seen at the office of the NAUTICAL MAGAZINE.

The following certificates from the engineers of the Baltic will speak for themselves:—

"TO ALL WHOM IT MAY CONCERN:

"I have been on board of the steamer Baltic, in the capacity of second engineer, up to the last of July, and since that time as first; and from my knowledge of her performance, I am satisfied that it is the best application of power yet made to the propulsion of steam vessels; and I am satisfied that she can run fourteen miles per hour, carrying one hundred tons weight, and twelve miles per hour carrying five hundred tons. I find the engines and propellers stand firmly; nothing has ever given way in heavy seas, when light or loaded. And I further believe that a very high rate of speed may be obtained by applying four such engines and propellers upon a boat of same tonnage, built light and sharp for speed—say from twenty-five to thirty miles per hour, which is the proportion of power that Captain Whittaker proposes to apply to passage-boats. The Baltic loads down four feet, while a passage-boat would not load down one foot. And I further say that the propellers steady and lift the boat, causing her to roll less than paddle-wheel boats; and the wheels being made of iron, will last any length of time, and will not break when they come in contact with drift-wood or logs, such as would break paddle-wheels, as has been proven in the case of the Baltic. I also endorse an article, dated June 22d, 1854, and published in the *Democracy of Buffalo*, signed by H. Whittaker, being a memorandum

of the Baltic on her trial trip to Clèveland, as being substantially true to my own knowledge.

"SAMUEL VAN EVERY, *Engineer.*

"BUFFALO, *January 2d,* 1855."

"TO ALL WHOM IT MAY CONCERN:

"I was first engineer of steamer Baltic up to the last of July, and assisted in putting up her engines and side propellers; and I am satisfied, by practical knowledge, that it is the best application of power to the propulsion of boats ever made; and I believe she can run fourteen miles per hour, carrying one hundred tons, and twelve miles per hour carrying five hundred tons; and I believe four such engines and propellers placed upon a boat of same tonnage, built light and sharp, would run from twenty-five to thirty miles per hour. We find no difficulty in securing the engines and propellers: they have stood the test in heavy gales, light and loaded, without the least break or give. They steady and raise the boat, and cause her to roll much less than paddle-wheels. The wheels are well protected, and will not break by striking logs or driftwood, as has been proven in the case of the steamer Baltic.

"I also endorse an article, dated June 22d, 1854, and published in the *Democracy of Buffalo,* signed by H. Whittaker, being a memorandum of the Baltic's trip to Cleveland, as being substantially true to my own knowledge.

"SAM'L HATHAWAY, *Constructor of Engines.*

"BUFFALO, *Sept.* 10*th,* 1854."

GREAT GUNS AND LITTLE SHIPS.

IN a letter to the Memphis Eagle, Lieut. Maury deplores the abandonment of the Navy-Yard at Memphis. After speaking of the importance of a Navy-Yard like that at Memphis, which would be near the Gulf of Mexico in time of war, he proceeds at some length to refute the argument which has been urged against it, that it would not be useful because of its inaccessibility to large ships. He says that large ships are not wanted for the defence of the Gulf, and it would be foolish to employ them there. Little ships and big guns are required, and there is water enough for these. The great guns carry further and shoot truer than the old thirty-twos or forty-twos. They send a ball weighing one hundred and fifty pounds or more, and the trials which have been made of them at various places, leave no

doubt of their destructive powers. All that has been done by the Allied fleets in the Baltic and Black Seas was accomplished entirely by little ships with big guns. The terrible waltz of Odessa was to the tune of big guns in little ships. Before Bomarsund could be attacked, the English had to send home for their diminutive auxiliaries; and finally, all further operations in the Baltic were delayed to the next season, until a fleet of these little ships with big guns could be built. It cost perhaps a million of dollars to build and equip the Duke of Wellington with her one hundred and twenty guns; and a vessel which did not cost perhaps one-tenth part of that amount, might destroy her in one or two shots from these big guns.—Lieut. Maury says:

"These new big guns will impart entirely a new feature to sea fights, Hereafter, and when they are properly appreciated in the right quarters, we shall have no more such costly things as the Pennsylvania, and other seventy-fours, and with the result of engagements that may follow. Seamanship. manœuvre and position are to be matters of comparatively small importance. Marksmanship, and marksmanship alone is to decide the battle when these big guns are brought into it. He whose shot tells first will be almost sure to whip; and the real practical question now to be decided, is as to the degree of marksmanship that is attainable with these guns at long range, and when the aim is rendered most difficult in consequence of the motion of both marksman and target to the wind and sea.—Ex.

Machinery of the U. S. Steam Frigate Wabash.—This vessel, now building at the Philadelphia Navy-Yard, has the following dimensions:—

Length between perpendiculars	265 feet,	8	inches.
" from knight-head to taffrail	287 "	7	"
Beam, moulded	50 "	2	"
" outside of plank	51 "	4	"
Depth of hold to gun-deck	26 "	2	"
" " spar-deck	32 "	7	"
Tonnage	3,200 tons.		

The machinery, building by Merrick & Sons, of Philadelphia, may be described as follows:—

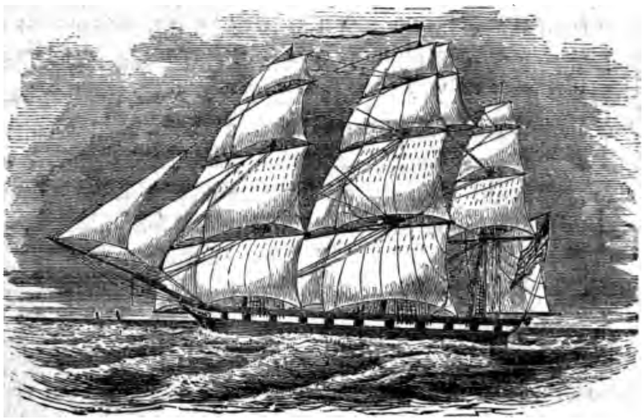
The four boilers have plain arches below, returning between vertical tubes above; these tubes are 3 feet 3 inches long, two inches outside diameter, of brass; each boiler has about 1,500 tubes, and the construction is such, that any tube proving defective, may be removed without disturbing the others. The engines of the Wabash are said to be somewhat similar to those of the French Steamer *Pomone*—the two cylinders being horizontal, 72 inches diameter, and 3 feet stroke, direct action, connecting at right-angles to the shaft. The propeller is to be of brass, 17 feet 4 inches in diameter, with two blades, and 23 feet pitch, or lead; number of revolutions, 50. The boilers are to be placed athwart-ships, and are 11 feet high, 13½ wide, and 15 feet long, having but one smoke-stack, 8 feet in diameter, and 60 feet high. This frigate will fight from two gun-decks, with fifty 8 and 10-inch guns. A competent engineer estimates her speed at 8 knots, in *fair weather*

THE GREAT AMERICAN TREATY MAKER.

THE "GUNBOAT QUESTION" SETTLED!

THE attention of the people, not only of this country, but of Europe, has more than once, of late years, been called to the improvements which are being made in the dreadful art of war. It is but a few years since we witnessed the destructive power of the Paixhan gun, in the explosive force of its shotted shell. We then have the torpedo for submarine explosion; next we have the great American peace-maker, which had well nigh destroyed an entire American cabinet; we then hear of the great Lancaster gun, of terrific power; and now we have the gun of all guns, in the model of a great gun which has just been completed and sent by the steamer of the 28th, directed to the Secretary of Foreign Affairs of her Majesty's Government. This gun, with its carriage, is designed to surpass all others, whether of ancient or modern times; and even Mr. R. L. Stevens, with all his improvements, in construction for harbor defence, the result of years of investigation, will most likely be laid quite on the shelf. The dimensions of this gun is set down at 98 feet of length, 12 feet diameter at the breech, and 24 inches bore, while that of the carriage is marked, in round numbers, at 300 feet long, and is the vessel itself, which is to be divided into longitudinal and transverse compartments, on the life-boat principle, as described in No. 4 of the last volume of the NAUTICAL MAGAZINE. The compartments, at the extremities, are designed to be partially filled with water, as occasion may require, for elevating the line of direction; the gun thus embedded in, and forming part of the vessel, is elevated or depressed, by trimming by the head or stern. The vessel is to be provided with an engine and screw propeller, and all other necessary equipments, and fully provided with spars and sails. There can be no question that this is the best mode of working such enormous guns, both as it regards safety and efficiency, water being a much better medium for the recoil than air. The gun is to be in two parts, and to have a water chamber for keeping it cool. There is unmistakable evidence in this enterprise of a full development of the destructive organs. Where's Uncle Sam?

Nautical Department.



LOG OF CLIPPER SHIP PANAMA.

WILLIAM P. CAVE, MASTER.

FROM SHANGHAE TOWARDS NEW-YORK.

DATE.	LAT.	LON.	COURSE.	WINDS.	REMARKS.
Oct. 27	28 40 N.	122 38 E.	S.S.W	N.N.E	At daylight, preceding this day, got under way at the bar, and stood to sea. Moderate weather. All sail set.
28	26 10	121 00	S.W. by S.	N.N.E	Moderate and cloudy.
29	23 00	118 01	——	N.N.E	Moderate and fresh at 6 P.M. Turn-about Island W. 8 miles.
30	19 32	114 56	S.S.W	N.N.E	Moderate and clear; all sail.
31	15 01	113 54	S.S.W	N.E	Fine and variable breezes.
Nov. 1	11 06	111 03	——	N.N.E	Rain and lightning; squally.
2	8 8	109 33	S.W	N.N.E	Rain, baffling and fresh; under easy sail; running between the shoals.
3	No observation		S.W. ½ S.	North	Moderate, cloudy, and squally. Six days were now spent in sailing from North Natunas to Gasper Island. Calm all night, with a heavy squall at daylight, and no wind during the day, so no journal was kept for the above interval.
4.					
5.					
6.					
7.					
8.					
9.					
10	No observation		——	South	Light airs and calms; beating through Gasper Strait, in company with barque *Candace*. She works well to windward in light weather.
11	No observation			South	Moderate and cloudy; these scant winds will lengthen the passage.
12	4 10 S.	——	——	S. by E	Moderate and cloudy.
13	No observation		——	E	Moderate with calms.
15	No observation		——	S.S.E	Civil Time; hove to off Anger; made Prince's Island at midnight.
16	8 44 S.	100 33 E.	——	S.S.E	Squally, strong winds; overhauled and passed clipper ship *Messenger*, which sailed two days before me
17	10 20	96 00	W.S.W.	S.S.E	Fresh winds; all sail set; large ship under our lee, supposed it to be the clipper *Game-cock*. Distance sailed to-day, 310 miles.

DATE.	LAT.	LON.	COURSE.	WINDS.	REMARKS
Nov. 18	12 20	91 03	W.S.W.	S. by E	Strong and steady winds; all sail set. Sailed to-day, 302 miles.
19	14 12	86 00	W.S.W.	S.E	Fresh trades; all possible sail set. Ship made 315 miles clear—330 by observation—current 15 miles.
20	16 01	81 23	——	S.E	All sail set; moderate trades. Sailed 301 miles.
21	17 43 S.	76 52	W.byS.½S.	S E	Moderate trades. Sailed 283 miles.
22	19 22	72 40	ditto.	S.E	Moderate. Sailed 256 miles.
23	20 44	68 38 E.	W. by S.	S S.E	Moderate and squally; rain.
24	22 10	65 00	——	S.E	Do. rain squalls; varying
25	24 44	61 38	——	S.E	Moderate and light airs.
26	24 24	57 00	West	E. by W	Do. fine and pleasant.
27	25 24	56 30	——	E.N.E	Light winds with calms.
28	25 56	55 25	Various	West	Heavy sea; light airs, by the wind.
29	27 26	50 46	West	S.S E	A seaman died; variable winds.
30	28 16	47 33	W. ½ N.	S.E	Moderate; all sail set; passed a bark and ship bound West.
Dec. 1	29 21	44 10.	W. by N.	S.S.E	Moderate and fine; no current.
2	30 02	42 00	ditto.	East	Light airs and calm; poor chance for a passage.
3	30 29	39 54	ditto.	E. by N	Light airs; hard looking clouds.
4	32 23	35 55	N.N.W.	E.N.E	Moderate; barometer falling; in royal studding sails; fresh and squally; wind hauling W.
5	31 23	34 04	N.	W	Strong winds; very heavy sea; reefed topsails; wind W.S.W.
6	31 13	32 40	W.	W.S.W	Fresh, and moderated to light airs.
7	32 59	30 05	W. ½ S.	N.N.E	Moderate; all sail set; running 13 knots; wind variable, and fresh and squally; three sail in company, for a short time only.
8	33 19	29 00	N.W.byW.	S.W	Strong gales; heavy sea; closing moderate.
9	35 08	25 21	W. by N.	South	Moderate; all sail set; by the wind.
10	35 41	21 00	W.N.W.	E.S.E	Moderate; passed a bark, water colored; trimmed by the wind.
11	30 55	15 18	N.W.byW	S.W	Fresh; passed four sail; ship making 13 knots; sea smooth; 8 P.M. Cape Good Hope bore N. 61 miles; all sail set.
12	31 39	10 45	N.W.byW	South	Fresh and fine; running 11½ to 12 knots.
13	29 31	6 30	N.W.	S.E	Fresh, with heavy thunder clouds.
14	28 29	2 40	N.W. byW.	S.S.E	Moderate and fine; passed ship *Scorgo*, having Forbes' rig, from Calcutta for Boston.
15	28 10	00 00	——	E	Light winds; all sail set; crossed meridian; strong southerly currents.
16	No obs.	1 30 W.	N.N.W.	S.S.W	Light airs and calms.
17	25 29	3 1 W.		S	Light airs and calms; moderate.
18	24 00	6 20	N.N.W.	E.S.E	Moderate with passing clouds.
19	22 00	9 56	——	S.E.	Moderate; southerly currents.
20	20 17	12 34	N.N.W.	E.S.E	Moderate; squally light rains.
21	18 38	15 41	——	——	Very baffling trades, and moderate; Capt. Cave is sick below.
22	16 22 S.	17 16 W.	——	——	Brisk and cloudy; Capt. Cave is very sick; strong S. currents.
23	14 55	19 55	N.N.W.	S.E	Moderate and fine; cloudy.
24	11 45	21 39	——	——	Variable trades; all sail set.
25	9 20	23 46	——	S.E.	Moderate; Capt. Cave is recovering.
26	6 36	26 36	——	——	Moderate trades and fine.
27	3 59	28 27	N.W.	S.E.	Moderate and pleasant.
28	2 00	30 40	N.W.	S.E.	All sail set; painted ship.
29	00 41 S.	33 06	N.W.	S.E.	Fine; two sail bound to Europe, and two South; 64 days out.
30	00 48 N.	35 06	——	S.E.	Moderate and very warm.
31	2 48	——	——	S.E.	Moderate and clear, with passing clouds.
Jan. 1	4 19	39 18	N.	N.E	Moderate and pleasant weather.
2	6 11	41 40	N.W.	N.E	Moderate and fine.
3	8 54	45 10	——	N.E	Fresh and fine; squally.
4	11 06	47 10	N.W.	N.E	Moderate and clear; all sail set; saw bark; soon passed her; middle part light and moderate from S. E.*

* Here we have S. E. Trades in the heart of N. E. Trades.

DATE.	LAT.	LON.	COURSE.	WINDS.	REMARKS.
Jan. 5	12 35	48 30	——	S.E	Light and fine, making poor progress.
6	13 30	50 10	N.W.	S.E	Moderate; poor chance for a good passage.
7	15 00	52 44	——	S.E	Light and calm; fresh and squally.
8	17 10	56 18	N.W.½W	N.E	Fresh squalls with rain; all sail.
9	20 03	60 48	——	N.E	Strong trades and heavy sea; ship making 300 miles per day.
10	22 48	65 42	W.N.W.	N.E	Strong winds; large quantities of sea weed.
11	24 48	68 40.	N.W.byW	N.E	Moderate; squalls in the morning.
12	26 23	69 46.	N.W.byW	N.E	Light. with calms and puffs.
13	27 08	70 36.	——	N N.E.	Light and variable; by the wind.
14	28 37	71 32.	——	S.E	Very light airs; all sail set.
15	31 27	73 27	——	N.E	Fresh and squally; split main top-gallant sail.
16	33 11	74 27	——	N.N.E	Moderate and fine.
17	34 43	74 28	N.	W	Light winds and calm.
18	37 27	74 10.	N.	E.S.E.	From light to strong winds.
19	38 40	72 43.	N.E.	N.W	Heavy gales; high sea; close ree ed canvass.
20	No observation.		——	N.W	Blowing hard; ship under close re top-sails; arrived at New-York

Length of passage 85 days; beating every sail in company, several of which were fine clipper ships. The Panama was built in New-York, by Thomas Collyer, and launched October, 1853. She is a very fast, but *not* a dry ship, and handles like a boat. On her passage from Liverpool to Shanghae, the Panama drawing 19 feet water, crossed the Line in Lon. 29° 7′, in 19 days and 20 hours, from Tuskar, having sailed 9 days in company with an English clipper, in *ballast* trim, with emigrants for Australia. She has not yet been beaten by any sail in company, and her only fault appears to consist in rolling very heavily, and taking large quantities of water on board in heavy weather. She frequently runs from 11 to 13 knots by the wind. On her last voyage she drew 17½ feet water.

Quick Passages.—The Golden Gate is reported to have made the passage from San Francisco to Panama in eleven days and four hours, and the George Law's running time from Aspinwall to Quarantine, at Staten Island, is stated by the Purser to be seven days and twenty-two hours. We think this pretty quick travelling. From Panama eleven days and four hours; Aspinwall to Quarantine, seven days and twenty-two hours—in all, nineteen days and two hours, running time.

WINDS.

FROM THOM'S PRACTICAL NAVIGATOR.

We have taken the liberty to make the following extract from a new work on Navigation, recently published in this city, and dedicated to the Merchant Marine of the United States, being the first attempt of the kind by a member of that service:

"The earth revolving on its axis from West to East, together with the great heat near the Equator, caused by the sun being always vertical in some part or other of the torrid zone, produces the Trade Winds.

"The motion of the earth causes the wind to blow from East to West, whilst the cold air rushing in from the North and South, towards the heated air in the tropics, produces the N. E. and S. E. Trade Winds, and which blow continually in those directions. Their limits extend to about 30° on each side of the Equator; but near to the coasts of America and Africa they extend to 34° sometimes. The limits of the Trade Winds are very variable, even in the same months of the year. When the sun has great North declination, their limits are considerably to the northward of where they are found when the sun has great South declination. In the month of June, for instance, the northern limit of the N. E. Trade may be found in about 30° North Latitude, and the Southern limit of the same, in about 10° North of the Equator. A space of calms and rain squalls intervene, until the Northern limit of the S. E. Trade is reached in about 4° N. of the Equator, its Southern limit, at this season, extends only to about 20° South of the Equator.

"In the month of December, when the sun has great South declination, the northern limit of the N. E. Trade Wind may be expected in about 20° North Latitude, and its Southern limit in about 4° North of the Equator. A space of calms and rain squalls intervene; and the northern limits of the S. E. Trade will be found in about 2° North of the Equator, and the southern limit about 30° South Latitude. It appears, then, that the limits vary to the extent of 10° in six months; and that the northern limit of the S. E. Trade Wind is always found to the northward of the Equator.

"Ships cross the region of calms, &c., between the Trades, quicker bound North, than they do when bound South, by reason of the airs of wind being more favorable.

"On approaching the limits of the Trade Wind, ships fall in with squally weather and heavy rains, a sure indication of a change. On entering the northern limit of the N. E. Trade, the wind will be found far to the Northward; but as you advance South, the wind will draw more to the Eastward. And in like manner the S. E. Trade is found far to the Southward, and draws more to the Eastward as you advance.

"Ships bound to the Southward should endeavor to cross the Equator in

about 25° W. Long., because they will meet the S. E. Trades sooner than they would if farther to the Eastward. They must, however, be careful not to go too far to the Westward before crossing the Equator, on account of meeting the S. E. Trade Wind far to the Southward, which heads them off to the Westward, and because of the Equatorial current which sets in toward the coast of Brazil. But in a fast sailing ship this may be much modified. When the vessel is caught in the variable weather which exists between the N. E. and S. E. Trade Winds, the rule is to keep on that tack upon which she makes the most southing, so as to get out of it as quickly as possible.

"Far to the Eastward, along the coast of Africa, the S. E. Trade is changed to a S. W. wind, which blows with little variation throughout the year, interrupted at times by violent tornadoes, and the Harmattan or East wind close to the coast. A ship taking this Eastern passage to the Cape of Good Hope, would certainly have to beat the whole way, though an advantageous slant is sometimes obtained when the wind veers at the quarterly changes of the moon.

"After losing the S. E. Trade, the usual variable winds are met with; but the most prevailing one is from the S. W. When a ship is bound to the East Indies, or Australia, the best parallel of latitude for running down her longitude to the East is 29° S., because there the Westerly winds prevail, and the weather is not so tempestuous as it is farther South.

"If bound to India, and having reached 70° E. Longitude, they steer more to the North, and fall in with the southern limit of the S. E. Trade in about 90° E. The limits of the Trade Winds here, are governed by the same laws as they are in the Atlantic Ocean; but they do not blow so steadily. The space between the northern limits of the S. E. Trade and the Equator, is occupied by a wind which blows six months, that is from May to October, from the Eastward, and called the Easterly Monsoon, and the other six months of the year in an opposite direction, and then called the Westerly Monsoon.

"After crossing the Equator and bound up the Bay of Bengal, the region of the regular Monsoons is reached. The S. W. Monsoon commences in May, and brings rain and squally weather, which continues six months, or until October. The N. E. Monsoon then commences, and during its continuance, from October to May, (the other six months of the year,) fine dry weather prevails on all the coasts of India. The monsoons vary their direction according to the locality of the place at which they blow. This includes the China and Arabian Seas. At the changes of the Monsoons, terrific hurricanes frequently occur in all these localities.

"In the Pacific Ocean, the S. E. Trade Wind is found to blow very steadily, with fine serene weather, and its limits are about the same as in the Atlantic Ocean. Not so, however, with the N. E. Trade; it is generally found light and invariable, and hangs far to the Northward, especially when the sun has great North declination.

"Ships bound to California, generally cross the Equator in about 112° West Longitude; but they seldom find the N. E. Trade blow with the same force as it does in the Atlantic.

"These are the principal winds which blow with any degree of certainty; but where there are large Islands or Continents within the limits of the Trade Winds, the surfaces of which becoming violently heated by the tropical sun, causes the regular wind to diverge into a local Trade."

EAST INDIA MARINE SOCIETY, SALEM.

SALEM, *February* 10, 1855.

MESSRS. GRIFFITHS & BATES:

Gentlemen,—I have been handed your note of January 24th, making inquiries respecting the history of the East India Marine Society of this place,—its objects, the number of its members, of what class of citizens composed, its collection of curiosities, the date of its organization, &c.,—which inquiries I will now endeavor to answer to the best of my ability.

The Salem East India Marine Society was founded in October, 1799, and incorporated March 3, 1841. It is composed of persons who have navigated the seas eastward of the Cape of Good Hope, or westward of Cape Horn, either as master or factor of any vessel belonging to Salem, or, if resident in Salem, of any vessel belonging to any port in the United States. The number of members at the present time is one hundred. None of the original members of the Society are now living. Since its foundation, this Society has numbered in its ranks some of the most eminent men of the age; and one of its early and most distinguished members and former president was the late Hon. Nathaniel Bowditch, LL. D., F. R. S., the world-renowned mathematician, author of the American Practical Navigator, and the translator and commentator of Laplace's "Mecanique Céleste." From the quarter-deck of a Salem ship he rose to the very summit of intellectual attainment in the highest walks of an abstruse science. Several others of its members have also passed along the same path to the halls of Congress, both as Senators and Representatives. Among them we need only mention the late Hon. Nathaniel Silsbee and Jacob Crowninshield.

The objects of the institution are—

First, to afford relief to disabled seamen and the indigent widows and families of deceased members and others from the income of the funds of the Society, which at the present moment amount to a little upwards of twenty-one thousand dollars.

Second, to collect such facts and observations as tend to the improvement and security of navigation, and the advancement of nautical science generally.

Third, to form a museum of natural and artificial curiosities, *particularly*

such as are to be found beyond the Cape of Good Hope and Cape Horn. This object has been obtained, to a considerable extent, chiefly by the voluntary donations of the members, as well as others, friendly to the institution; and the whole collection is placed in the hall where the Society holds its meetings. This collection now consists of curiosities from all quarters of the globe, and comprises, perhaps, as choice a variety as can any where be found. Visitors are admitted to the musuem at all times gratuitously, the whole expense being paid by the voluntary contributions of the members of the Society. How far the Society has fulfilled the expectations of its founders can partly be seen by the catalogues and statements in its possession, which are open to the inspection of the public.

In its early days the citizens of Salem were annually gratified with the novel and interesting spectacle of its procession through their streets, with its palanquin supported by bearers in East India costume, preceded by the president, dressed in the rich robes of a Chinese mandarin, and accompanied with its music and military escort. The sight was an imposing one. Salutes were fired upon our wharves in honor of the Society as it passed, and the stores on many of them were elegantly dressed in colors. But in this utilitarian age the practice has been entirely discontinued, and the spectacle has even become, with most of us, among the dull things of memory.

We do not think that it is too much to say, that our city owes to this Society, next to its "*witches*," one of its greatest attractions to strangers in the rare and beautiful collection of curiosities above referred to. Here you may see the grave and dignified mandarin of China in his splendid robes, looking complacently, as it were, upon a group of natives, of different castes, from Calcutta, seated upon the floor, after the custom of their country, and surrounded by birds of the most gorgeous and exquisite plumage, from the upper provinces of Bengal and different parts of India. Here, also, is the last abiding place of "*Koila Moku*," the god of medicine, with his capacious mouth and star-like teeth, from the immense pile of human bones, "sufficient to fill Faneuil Hall," with which he was surrounded in his native home, the Island of Hawaii, one of the Sandwich Island group. He is the last of the gods on these islands, and curiously illustrates the moral degradation and mechanical skill of these children of nature previous to their conversion to Christianity. In fact, it would be an easier task to describe what is not, rather than what is, seen within this Hall.

Of the assistance rendered by this Society in the advancement of science and the improvement of navigation, we can only say, that the journals of its members on their various voyages to the East, found in its archives, furnish a fund of interesting and useful information, such as, probably, can be found nowhere else. It has in its possession several journals, from Batavia, to that hitherto sealed and unexplored country, Japan, made by Salem ships previous to the commencement of this century, illustrating the manners, customs, and modes of transacting business, with that interesting people.

As the visitor enters the spacious hall of the museum where the Society

holds its meetings, his attention is arrested by an admirable full-length portrait of its late president, Doctor Bowditch. Here he still seems to preside in person over a favorite scene of his labors, infusing his own life and energy into every department of the Society. Beside this, there are several other portraits of our most distinguished merchants and statesmen of former times, the whole of which, taken in connection, "affording a proof alike of the enterprise, taste, and liberality, of such of the citizens of Salem as have followed a seafaring life."

Very respectfully, yours,
C. M. Endicott,
Pres't of the East India Marine Soc'y.

THE SAMOAN, OR NAVIGATOR'S ISLANDS.

The following interesting statistics relating to these Islands are from the *Samoan Reporter*:—

Population of Upolu	15,587
" of Savaii	12,444
" of Tutuila	3,389
" of Manua	1,275
" of Manono	1,015
" of Apolima	191
Total population of the group	33,901

This number consists of 11,736 men, 9,844 women, 6,456 boys, and 5,865 girls. At the harbor of Apia, in Upolu, the foreign residents number about 60. Perhaps there may be 60 other white men scattered here and there throughout the group.

In 1730, when the first missionary visit was made to these Is lands, all the inhabitants were heathens, and without a written language.

The most important island of the group is Upolu, principally on account of its having the commodious harbor of Apia, which is visited by the South Pacific whalers, and nearly all American vessels traversing those seas.

Tutuila has also the fine harbor of Pago Pago, and Iavaii that of Matoate; but during certain periods of the year they are not so accessible as Apia, and consequently nothing like so much frequented. These islands abound in all the tropical productions, and are capable of being rendered, by the expenditure of

capital and the employment of labor, no inconsiderable emporiums of tropical merchandise. The fertility of the soil and the luxuriance of vegetation in Upolu are not surpassed in any part of the world, and it is justly styled the "garden of the South Pacific." The harbor of Apia is likely to become a very important port in that part of the world. It is the residence of the American and British Consuls, and is at times the scene of much life and bustle.

Since there is the prospect of a considerable traffic between California and Australia, the Navigator Islands will become a very important territory, and will attract a white population, who will invest capital and employ native labor, which can be obtained from the neighboring islands on advantageous terms.

The port of Apia, in the island of Upolu, is well worth the attention of the people of the United States.

Many vessels from San Francisco to Sydney and Melbourne, calling at Samoa, have lost much time in consequence of not knowing the exact position of Apia. Frequently they have mistaken the island of Sawaii for Upolu, and, rather than lose time in beating to windward to the proper port, where the consuls reside, and where vessels may be quickly supplied with whatever they may require, they have anchored in an open roadstead, or in unsafe harbors, where, in case of accident, it is possible they would lose their insurance.

The harbor of Apia lies about half way down the north side of Upolu, in lat. 13° 51′ 20″ South, and long. 171° 44′ West. A pilot lives to windward of the port, who goes off to vessels when a few miles distant.

LAUNCHES IN NEW-YORK.—Messrs. Roosevelt & Joyce launched from their yard the ship Titan, for Mr. D. C. Baker, of Boston. She is about 2,000 tons register, and calculated to carry 7,000 bales of cotton. Captain Oliver Elkridge is her commander.

Messrs. Jacob A. Westervelt's Sons & Co., launched from their yard the pilot-boat Edwin Forrest, for a company of New-York and Sandy Hook pilots. She is 100 tons burthen, and her model is a counterpart of the pilot-boat Jacob A. Westervelt, by the same builders.

SAILING DIRECTIONS FOR HAKODADI,

BY LIEUTENANT WILLIAM L. MAURY, U. S. N.

U. S. STEAM-FRIGATE "MISSISSIPPI,"
AT SEA, JULY 20TH, 1854.

THIS spacious and beautiful bay, which for accessibility and safety is one of the finest in the world, lies on the north side of the straits of Sangar, which separates the Japanese islands of Nippon and Yesso, and about midway between Cape Sirija Saki* (the N. E. point of Nippon) and the city of Matsmai. It bears from the Cape N. W. ½ W., distant about 45 miles, and is about four miles wide at the entrance, and five miles deep.

The harbor is the southeastern arm of the bay, and is completely sheltered, with regular soundings and excellent holding ground. It is formed by a bold peaked promontory, standing well out from the high land of the main, with which it is connected by a low, sandy isthmus, and, appearing in the distance as an island, may be readily recognized.

The town is situated on the northeast slope of this promontory, facing the harbor, and contains about 6,000 inhabitants.

Approaching from the eastward, after passing Cape Suwo Kubo, named on our chart Cape Blunt, which is a conspicuous head-land 12 miles E. by S. from the town, the junks at anchor in the harbor will be visible over the low isthmus.

FOR ENTERING THE HARBOR.

Rounding the promontory of Hakodadi, and giving it a berth of a mile, to avoid the calms under the high land, steer for the sharp peak of Komaga-daki, bearing about north, until the east peak of the Saddle, bearing about N. E. by N., opens to the westward of the round knob on the side of the mountain; then haul up to the northward and eastward, keeping them open until the centre of the sand hills on the isthmus bears S. E. by E. ¾ E. (These may be recognized by the dark knolls upon them.)

* Saki, in the Japanese language, means cape; consequently it should be more properly called Cape Sirija; but to prevent mistakes, it has been thought advisable to adopt the Japanese names.

This will clear a spit which makes out from the western point of the town in a N. N. Westerly direction two-thirds of a mile; then bring the sand hills a point on the port bow, and stand in until the western point of the town bears S. W. ½ W.; then you will have the best berth, with 5½ or 6 fathoms water. If it is desirable to get nearer in, haul up a little to the eastward of south for the low rocky peak, which will be just visible over the sloping ridge to the southward and eastward of the town. A vessel of moderate draught may approach within a quarter of a mile of Tsuki point, where there is a building-yard for junks. This portion of the harbor, however, is generally crowded with vessels of this description; and unless the want of repairs, or some other cause, renders a close berth necessary, it is better to remain outside.

If the Peak or Saddle is obscured by clouds or fog, after doubling the promontory, steer N. by E. ½ E., until the sand hills are brought upon the bearing above given, when proceed as there directed.

A short distance from the tail of the spit is a detached sand-bank, with 3½ fathoms on it, the outer edge of which is marked by a white spar-buoy. Between this and the spit there is a narrow channel, with 5 and 6 fathoms water. Vessels may pass on either side of the buoy, but it is most prudent to go to the north ward of it.

Should the wind fail before reaching the harbor, there is a good anchorage in the outer roads, in from 26 to 10 fathoms.

Excellent wood and water may be procured from the authorities of the town, or, if preferred, water can be easily obtained from Kamida creek, which enters the harbor to the northward and eastward of the town.

The season, at the time of our visit, was unfavorable for procuring supplies—a few sweet and Irish potatoes, eggs and fowls however, were obtained; and these articles, at a more favorable period of the year, will, no doubt, be furnished in sufficient quantities to supply any vessels that may in future visit the port.

Our seine supplied us with fine salmon, and a quantity of othe fish; and the shores of the bay abound in excellent shell-fish.

During our stay in this harbor, from the 17th May to the 3d

June, the weather was generally pleasant until the 1st of June, when the fog set in. It was usually calm in the morning, but towards the middle of the day a brisk breeze from S. W. sprung up.

Latitude Mouth of Kamida creek,	41°	49″	22′	N.
Longitude " " "	140	47	45	E.
Variation, ...	4	30		W.
High water, F. & C., ...V hours.				
Extreme rise and fall of tide,............3 feet.				

Our chronometers were rated at Napa Kiang, Lew Chew, from the position of that place, as given by Captain Beechy, R. N.

By order of Commodore M. C. Perry, U. S. N.

SILAS BENT, *Flag Lieut.*

LAUNCHES FOR THE PAST MONTH IN THE U. S.

At Stonybrook Harbor, Long Island, 26th ult., a schooner of 500 tons, called the Tanner, owned partly by Messrs. Deshler, Potter & Co., of New-York.

At Key West, Jan. 23, brig Daniel Maloney.

At Rockland, February 1st, a freighting ship of 1,219 tons, called the Oliver Jordan.

Barque Alma, of 600 tons, was launched 17th inst., from the foot of Fifth-st., East River. She is owned by Messrs. Wakeman, Dimon & Co., and is intended for a Texas packet.

At Lincolnville, recently, by Mr. Z. J. French, a fine brig of 270 tons, called the Flying Eagle.

The ship of about 650 tons, launched 23d ult., at West Harpswell, Me., has been named the Harpswell.

At Baltimore, Feb. 23, a medium clipper barque of 325 tons, fully masted, called the John C. Brune.

At Petty Island, near Philadelphia, 27th ult., a ship of 1,500 tons, called the Bridgewater. She is intended for the European trade.

At Rockland, March 3d, ship Cincinnatus, 1,144 tons. Brig Tyrant, 211 tons.

At Mobile, from the Dry Dock shipyard, a schooner of 150 tons.

At Wood's Hole, Falmouth, a clipper schooner of 260 tons, called the Sea Foam, and will be employed in the general freighting business.

At Rockland, Feb. 21st, a clipper ship of about 1,300 tons, called the Young Mechanic.

Ship Cathedral, built for Enoch Train & Co's Boston and Liverpool line of packets, was launched at Portsmouth, 3d inst. She is about 1,700 tons register.

At Rockland, a freighting ship of 840 tons, called the Louisa Hatch.

NOTICES TO MARINERS.

It is of great consequence to the mariner to be put in possession of reliable information concerning the discovery of dangers at sea, changes of lights, light-ships, beacons, buoys, and other guides to safe navigation. It is our intention, hereafter, to publish full and correct accounts of all such notices as are issued by the Light-House Board at Washington, together with brief accounts of all dangers to navigation, which are given through the medium of the daily press. The shipmaster may, therefore, rely upon the *Nautical Magazine* for these important particulars, and upon returning from a long voyage will have no difficulty in becoming informed in relation to all the changes that may have been made in the above guides to Navigation during his absence at sea. Mariners are invited to communicate their own observations.

Minots' Ledge Light-Boat.—The Light-boat for Minots' Ledge drifted from her moorings on Friday, in the snow storm, and is said to have gone ashore at Cohasset.

Complaints having recently been made of a want of light on board the Pollock Rip Light-boat, Capt. Baxter states that the boat was forced from her moorings by a violent gale, and to show a light in her false position would only delude mariners. He has succeeded in getting the boat upon her station, and is now showing a good light.

Light-house on Point Pinos, the Point South side of the Entrance to the Harbor of Monterey, California.—A fixed white light, illuminating four-fifths of the horizon. The light-house is a gray granite dwelling, one story in height, surmounted by a tower and lantern. The lighting apparatus is of the third order, Fresnel Catadioptric. The light is fifty feet above the level of the sea, and should be visible in ordinary states of the atmosphere from an elevation of ten feet above the sea, at a distance of 11¾ nautical, or 13¼ statute miles. Latitude 37° 41′ 36″ N.; Longitude, 122° 59′ 12″ W.

Buoy on Blossom Rock.—A Spar Buoy, painted red and black, was placed on Blossom Rock, San Francisco Harbor, on the 9th of January, by the officers of the United States revenue cutter, W. L. Marcy, acting under orders from the Light House Board. The Buoy is set in four fathoms water, about half-cable's length due South from the shoalest point of the rock. Vessels giving the Buoy a berth of a cable's length in any direction, will pass clear of all danger.

Buoys are always to be placed on the Anita Rocks, South West Spit of Southampton Shoal, Invisible Rock, and Commission Rocks.

Nantucket South Shoal Life-boat Ashore.—The Government Life-boat from Nantucket Shoals is ashore on Montauk. She parted her moorings 5th inst., and landed on Montauk, about one and a half miles West of the light, on the South side of the island.

The Light House Board state that in consequence of this Light-boat having gone ashore at Montauk Point, they will take measures to replace her as soon as possible.

The Life-boats having their regular stations off Upper and Lower Cedar Points, on the Potomac, are under repair at the ship-yards in Alexandria, and are to be entirely renewed and refitted. They will be replaced at their stations early in the spring.

MEDITERRANEAN—ADRIATIC, CURZOLA CHANNEL—BEACON OF LUSNAC SHOAL.—Official notice has been received at this office, that on the middle of the Lusnac Shoal, which lies between the rock of that name and the Island of Badia, in the Eastern entrance of the Channel between the Islands of Curzola and Sabioncello, a Floating Beacon has been placed in five feet water. It is of a four sided pyramidal form, the upper part of which is painted red, and the lower part white; and to avoid this shoal vessels must keep 20 fathoms distant from the Beacon.

Office Light-Board, Feb 3, 1855.

LIGHT VESSEL NEAR RATTLESNAKE SHOALS, OFF CHARLESTON, S. C.—A Light Vessel will be anchored in 6 fathoms water, near the Rattlesnake Shoals, off Charleston Harbor, on or about the 20th proximo, [Feb. 1855,] to guide vessels clear of those shoals.

The following is a description of the Light Vessel:—Length, 98 feet; breadth of beam 23 feet; rail 8 feet above water; tonnage about 250; hull white, with the words "Rattlesnake Shoal" painted on each side, in large black letters. Has two masts, painted yellow; top-masts black, with an open work oval iron day-mark, 6 feet in diameter, on each, at an elevation of 54 feet from the water.

Two lights, [one on each mast,] will be exhibited from sun-set to sun-rise, daily, at an elevation of 40 ft. from the water. Each light will be produced by eight lamps and 12 inch parabolic reflectors, and should be seen, in good weather, from an elevation of 15 feet, at a distance of 12 or 13 nautical miles.

The following bearings and distances indicate the approximate position of this vessel:—From Vessel to Rattlesnake Shoals, N. W., 2½ miles. From Vessel to to Outer Bar of North Channel, W. 4½ miles. From Vessel to Fort Moultrie, distant 6½ miles. From Vessel to nearest land, 4 miles.

Notice will be given when this Light Vessel is moored, and the exact positions and bearings stated.

By order of the Light-House Board—Jan. 25, 1855.

LIGHT-HOUSE IN N. W. CHANNEL, KEY WEST, FLORIDA.—This Light-House, recently erected, is situated on the Western bank, forming the N. W. Channel, in 6 feet ordinary low water.

The position may be approximately laid down by the following Magnetic bearings and distances:

Sand Key Light-house S. 11° 03′ East—10 nautical miles.

N. W. Bar Buoy, N. 20° 46′ E., distant 1.31 nautical miles.

The structure is founded on piles; the dwelling is 23 feet above the level of the water, and is surmounted by the lantern.

The foundation is painted of dark color; the dwelling and lantern white.

The illuminating apparatus is a Fresnel, fifth order, illuminating 270° of the horizon, and showing a fixed white light.

The focal plane is 40 feet above the sea level; the light should therefore be seen in clear weather from the deck of a vessel 10 feet above the water at the distance of 11½ nautical miles, or about 10 nautical miles beyond the Bar.

The light will be exhibited for the first time on the 5th of March prox., and will continue to be exhibited from sunset to sunrise, on each succeeding night, till further notice.

To enter this channel by day, bring the Light-house to bear S. by W. ¾ W. Mag., or in range with the Buoy on the Bar and the Western end of Mullet Key, then run till the Bar is crossed, and Buoy No. 2 is made; then haul up S. E. ¾ E. Mag. for Buoy No. 1.

To enter by night, bring the light to bear S. by W. Mag., and run on that course till Key West bears S. E. ¼ E., when haul up for it, and when in three fathoms, anchor for the night.

This light is designed to notify mariners of their approach to the Bar, and to guide them over it by night and day, but it is not intended nor can it be used as a guide in the passage from the Bar to Key West. Dependence for this purpose must be had in the day-time on the channel buoys and ranges on shore, and at night on the bearings of Key West and Sand Key lights—to ascertain the relative position of which, mariners are recommended to provide themselves with the chart of this harbor, published by the Coast Survey.

By order of the Light-house Board—Feb. 9, 1855.

PALACE VALETTA, January 9, 1855.

NEW LIGHT-HOUSE ON DELIMARA POINT, SOUTH EAST END OF MALTA.—A Light-house has been erected on Delimara Point, (Marsa Scirocco,) from which a Red Fixed Light will be exhibited on the 1st of February, 1855.

This Red Light is elevated 148 feet above the sea level.

The Light-house is a circular building 58 feet in height.

The light will be shown from sunset to sunrise.

Its position is on a rocky promontory, which forms the Eastern boundary of the Bay of Marsa Scirocco, for which anchorage it will be a safe guide,

It shows over an uninterrupted arc of the horizon of 270° from N. 35° E. round by the Southward, to N. 55° W. (Magnetic ;) the quadrant darkened being only on the land side.

By daylight it will be conspicuous ; and the clearing marks for giving a wide berth to the Monsciar Reef in its neighborhood, as also for sailing between the reef and the shore, as given by Cap. Spratt in the latest chart, published by the Admiralty Hydrographical Office, cannot fail to be of the utmost importance to navigation. They are as follows :

To clear the Monsciar Reef, keep St. Elmo Light-house (at the entrance of Valetta Harbor,) open of Ricasoli ridge N. 48° W. (Magnetic.)

To sail between the Monsciar Reef and the shore, if from the Northward keep the Light-house (Delimara) in one with Sciropsil Chagin Point, which will lead through.

If approaching from the Southward, Zoncor Tower, its breadth open of St. Thomas Point, is a safe course.

MEDITERRANEAN—MARSA SCIROCCO BAY, MALTA—RED LIGHT ON DELLA MARE POINT—Official information has been received at this office, that on the 1st of February inst., a fixed Red Light was established on the South Point of the Rocky Peninsula, which forms the Eastern shore of Marsa Scirocco Bay, called Della Mare Point.

The light is 148 feet above the sea, and visible in all directions, excepting from the land side, between the bearings of S. 35° W. and S. 55° E. This elevation of the light would command a horizon of 14 miles radius, but its red color will probably reduce its limits of easy visibility to half that distance.

The tower is a circular building, 58 feet high, and serves as a mark for clearing the Monsciar Reef. To pass to the Northward of that Reef, keep St. Elmo Light-house (at the entrance of Valetta Harbor) open to the Northward of Ricasoli ridge of hills, and bearing about N. W. ½ W.

To run through the Monsciar Pass, (between the reef and the shore,) keep the light tower in one with Scirop Point. And to take the same pass, when coming from the Southward, keep Zoncor Tower its own breadth open of St. Thomas Point.

All the above bearings are magnetic.

By order of the Light-house Board—February 17, 1855.

TIME BALL AT DEAL.—Official information has been received at this office, that a Time Ball has been established in the Royal Navy Yard at Deal, for the purpose of giving Greenwich mean time to passing vessels.

The Ball will be raised half mast high at five minutes before 1 P. M., nearly, and will be raised to the mast head at three minutes before 1 P. M., nearly, every day.

The time to be noted is the instant at which the Ball begins to fall from the cross arms of the vane.

At the instant of 1 P. M., Greenwich meantime, the Ball will be dropped.

Should any derangement of the machinery prevent the Ball from being dropped at 1 P. M., it will be kept at the mast-head for 10 minutes, and will then be lowered gradually. It will again be raised, and dropped by hand, at 2 P. M. Greenwich time; but the accuracy of that time cannot be guaranteed within two seconds.

By order of the Light-house Board—February 17, 1855.

THE LIGHT SHIP AT MARTIN'S INDUSTRY.—Savannah, March 7.—Pilots, shipmasters, and others will be pleased to learn that the light ship, which has for some time been lying in our port, will shortly resume her position at Martin's Industry. She is now taking aboard her mushroom anchor, which was brought in the ship New-England from New-York, and weighs 4,350 lbs. Her repairs have been completed some time, and she has been awaiting the arrival of the anchor.

LIGHT-HOUSE AT TUCKER'S BEACH, LITTLE EGG HARBOR, N. J.—On or about the first day of June next, 1855, a fixed White Light, varied by flashes, of the 4th order of the system of Fresnel, will be substituted for the present fixed red light at Tucker's Beach Light-house, near the entrance of Little Egg Harbor, N. J.

The Light will be exhibited at an elevation of 50 feet above the level of the sea; will illuminate the entire sea horizon, and the approaches to Little Egg Harbor, and should be seen under ordinary states of the atmosphere, from a height of 15 feet above the water, at a distance of 12½ nautical or 14¾ statute miles.

The tower is white. The approximate position is: Lat 39° 30′ 17″ N., lon. 74° 16′ 48″ W.

Due public notice will be given of the day upon which the change will be made.

By order of the Light-house Board.

MEMORANDUM OF HINTS FOR STRANGERS IN MAKING KURRACHEE LIGHT-HOUSE.—East India House, January 19, 1855.—Kurrachee Light-house is on Manora Point, and in lat. 24° 47′ 21″ N., lon. 66° 58′ 24″ E., var. 11° 56′ Easterly, 1851.

During the fair season, (the fair season may be considered to extend from the 25th September until the 30th of May,) vessels may make the port direct after passing the Hujamree Banks; in lat. 24° 10, the coast is quite safe to approach anywhere to 5 fathoms, but off the Hujamree Banks vessels should not come under 10 fathoms, and may anchor off the port, with the Light-house bearing from N. E. to N. N. W., distance 1 to ¾ miles.

There are strong North-easterly winds at times between November and March, and about January there are sometimes gales from the West South Westward, with a heavy sea.

Manora Light-house is fixed at an elevation of 119 feet above the mean level of the sea, and may be seen 15 to 16 miles off; high water at full and change, 10h. 15m.; rise and fall 9 feet, but the tides are very irregular.

During the southwest Monsoon, vessels should make Cape Mouse, properly Ras Manrie, which is 18 miles to ½ North from Manora Point; and if the weather is very bad, or the tide should not suit for crossing Kurrachee Bar, she should maintain her position to the windward, bearing in mind the probability of the existence of a S. E. current.

The coast of and between Ras Manrie and Manora Point is not safe to approach under 15 fathoms, and if Manora Point is visible, do not bring it to the Southward of East—vessels should not anchor off the port, but if it is necessary, the best position is with the fort bearing N. E. by N. to N. E. by E., distance 1 to ¾ mile, in 7 or 8 fathoms, and a long scope of cable should be veered at once to insure holding on.

To the Southward of the port vessels should not come under 8 fathoms, or bring Manora Point to the Westward of North; and under no circumstances, except the most urgent necessity, should vessels anchor on the coast to the Southward during this season.

The Church Tower in range with the North Middle Rock, leads you up to the Bar, and the stump and old beacon in range over it, in 11½ feet at low water, then pass the inner buoy about 50 or 70 yards to the Westward, then steer for deep water point, or the ships at anchor.

Off Manora Point, flood sets to the Eastward, and ebbs to the Westward ½ to 1 knot per hour.

Bound out in the S. W. Monsoon, it would be advisable to work out to West South Westward into about 15 or 20 fathoms windward of Manora, before stretching to the South; for although a vessel might go along shore direct from the entrance of the harbor, she might get into difficulties by the wind falling light, and the tides setting her in towards the mouths of the rivers; in passing the Hujamree Banks, which extend from lat. 23° 55′ to 24° 10′, and lon. 67° 14′, she should not be in less than 20 fathoms, or more than 2 to 4 four miles East of the meridian of Manora.

The S. W. Monsoon does not blow strong generally on the coast of Scinde; the wind at times is variable, and generally so when it rains, which is mostly in July.

I would caution all persons to be careful about anchoring anywhere on this coast, if there is any sea on—it would be much more advisable to keep under weigh.

Vessels making the Light-house should always endeavor to come within signal distance before dark, but if not able to do so, to keep standing off and on till daylight; they should endeavor to pick up the pilot boat without delay if she displays a Pilot Jack, for when she does so, it is to intimate that there is no time to be lost to save the tide, but in picking up the pilot no vessel should run down to the Eastward, further than to bring the Light-house to bear N.

The Pilot is usually in a European rigged boat, but if in a native boat the Pilot Jack is hoisted.

In the S. W. Monsoon no vessels which require to enter the harbor at once should draw more than 16 feet 6 inches for the spring tides, and 15 feet for the neap tides.

For coming into the harbor, vessels should have all the fore and aft sails that belong to them bent, and their hawsers on deck, with everything ready for laying out a kedge anchor.

In consequence of the tides being irregular, persons are apt to be out in working them; therefore a red burgee at the yard arm of the flagstaff will signify that it is flowing, and when at the masthead that it is high water. A blue burgee at the yard-arm will signify that the tide is ebbing, and when at the mast head that it is low water.

Sunken Rock near the Entrance of the Harbor of St. Thomas.—The existence of the sunken rock near the entrance of the above harbor, on which the clipper ship Star King struck, is stated to have been previously unknown, there being 20 feet of water on it, and the Star King having been the largest merchantman that ever entered the harbor, drawing 22 feet. The exact bearings of this rock were furnished to Capt. Turner, of the S. K., to be forwarded to the surveying Department at Washington, and will probably be published hereafter.

United States revenue cutter W. L. Marcy, and United States schr. Argus, arrived at San Francisco 23d ult., from a cruise, having placed Buoys on Commission and Invincible rocks; also a large spar buoy on the Southern edge of Southampton Shoal. The bearings of the above buoys, &c., will be given by Capt. Graham in a short time.

In pursuance of the resolve, experimentally to introduce Hamburg Cruising Pilots, the schooner Cuxhaven has been built for government account, and is next to be put on duty.

She carries the Hamburg Government Flag, and the well known large Pennant of the Hamburg Pilot Galliote (Loots Galliote); at night she will display a reddish light, and is distinguishable besides by the No. 1, in black paint on her foresail.

She is detailed to cruise between the mouth of the Elbe, Borkum and Heligo-

land, in order to supply Pilots to inward bound vessels; but within sight of the outer station of the Pilot Galliote, she is not permitted to furnish Pilots, unless the said Galliote should be off her station or unable to transfer Pilots.

Such vessels as take a Cruising Pilot, comply, in so doing, with their obligations as expressed in Sec. 15 A, of the Piloting Ordinance (Loots Ordnung) of 1838. The hoisting of a Pilot Flag at the foretop, or of a lantern at night, signifies the desire to receive a Pilot on board.

The Cruising Pilot brings the vessel to Cuxhaven, and there gives her over to a River Pilot, who takes her to the "Boesch;" but one pilotage only, from Sea to the Boesch, is charged, and this is for each Hamburg foot draft.

During Summer, to wit, from 1st of April to 30th September, Nine Marks, (currency.)

During Winter, to wit, from 1st October till 31st March, Twelve Marks, (currency.)

Vessels of less draft than ten feet, will be called ten feet.

Vessels who take, besides the Cruising Pilot, another one from the Pilot Galliote, will have to pay for the latter according to the existing scale.

In all other respects, the regulations of the former Piloting ordinance remain in force.

The Committee on Navigation of the Port of Hamburgh.

HAMBURG, 9th January, 1855.

PUMPKIN ISLAND LIGHT-HOUSE, MAINE.—Notice is hereby given that a Light-house has been erected on Pumpkin Island, Maine, which is intended to serve as a guide to the Western entrance of Edgemoggin Beach and to Buck's Harbor, Maine. The tower is built of brick and painted white; the keeper's dwelling is painted brown. The tower is 17 feet high, and the focal plane is 27 feet above the level of the sea, seems a distance of 9 nautical or 9½ statute miles. The approximate position of this Light-house, as given by Blunt's chart, is lat. 44° 18 N., lon. 68° 45 west of Greenwich. The light will be lighted for the first time at sunset, January 1, 1855, and will be kept burning every night thereafter from sunset to sunrise.

By Order of the Light-house Board.

PORTLAND, Me., December 1, 1854.

BEARINGS AND DISTANCES OF ROCKS, SHOALS, LEDGES, ETC., FROM PUMPKIN ISLAND LIGHT-HOUSE, AND SAILING DIRECTIONS FOR EDGEMOGGIN BEACH, AND FOR AVOIDING THE DANGERS.

West Triangle ledge bears N. E. by E. ½ E. dist. ½ of a mile.

East Triangle ledge bears E.N.E., dist. ½ of a mile.

These ledges have about 4 feet water on them at low water, and there is a good passage between them and the light.

The ledge making out to the Northward and Eastward from Pumpkin Island is covered at high tides, but the water is bold close to the outer point.

The water is bold close up to the North point of Pumpkin Island, and the point can be passed safely within the distance of the length of the vessel.

At about a cable's length from the shore on the West and Northwest part of the island there is shoal ground with four feet at low water.

There is a good passage of 6 feet at low water between Pumpkin Island and Deer Island. When bound to the Eastward the port shore must be kept close on board.

Merriman's Ledge bears West, dist. ¾ of a mile; bare at extreme low tides. The leading mark for this ledge is Billing's house (on the North side of the Beach) in range with the Light-house. By keeping the house out either way of the high part of the Island will lead clear of the ledge. The cross mark is to bring the points of Deer Island and Birch Island open an oar's length. The ledge is about 20 fathoms in width and the water bold.

Two-Bush Ledge bears W. by S. ½ S., dist. about 1¾ miles. It has four feet water on it at low tide; is about the dimensions of the deck of a vessel of 150 tons, and the water bold. This ledge bears N. by W. ½ W. from Eagle Island

Light-house. The leading mark for Two-Bush Ledge is the barn on Beach Island, open a handspike length from the South point of Hog Island. The cross mark is Two-Bush Island in the gap North of Eagle Island light. Two-Bush Island is small, without bushes or trees, produces grass, and appears green in summer. It had formerly two bushes upon it, from which it derived its name. The water is bold close to it. It bears S. W. from the Pumpkin Island light, and N. by W. ½ W. from Eagle Island light.

Spectacle Island Shoal.—This shoal lies on the North side of the channel leading to Buck's Harbor; bears from Pumpkin Island light W. by N., dist. 2½ miles; from the South point of Spectacle Island, E. ½ S., dist. ½ mile; from Long Ledge, S. W. ½ W., dist. 1 mile, and has 4 feet water on it at low tide. It is about half an acre in extent, with a number of large rocks on it.

In passing Cape Rosiere, bound to the Eastward, to clear it to the Southward keep the passage between Pumpkin Island and Deer Isles open a handspike's length, and when Two-Bush Island and the West end of Pickering's Island are in range you are up with the ledge.

In running for Buck's Harbor, to clear the ledge, keep Walker's house (a conspicuous white house on the Eastern part of Buck's Harbor) open an oar's length from Long Ledge.

Long Ledge lies on the North side of the channel, and is nearly covered at high water, but is exposed at low water; may be known by a single rock which lies a cable's length S.E. from it, and which is visible at half tide. This ledge bears N. W. ½ W., distant about one mile from Pumpkin Island light, and from the West entrance to Buck's Harbor, S.W. ½ W.

PILOTAGE.

Fees for Pilotage at the Port of New-York.

SANDY HOOK.

Fees for Inward Pilotage.—For every vessel drawing less than 14 feet water, per foot, $2 44; 14, and less than 18, $3 06; 18, and less than 21 feet, $3 69; 21 and upwards, $4 31 per foot; for every armed vessel, $5. If boarded out of sight of Sandy Hook Light-house, one-fourth of the above rates added. From Nov. 1st to April 1st, four dollars are added to the full pilotage of every vessel.

For Outward Pilotage.—For every vessel drawing less than 14 feet water, per foot, $1 81; 14, and less than 18 feet, $2 12½; 18 feet, and less than 21 feet, $2 75; 21 feet and upwards, $3 18¾ per foot—for every day's detention, $3.

NEW-JERSEY.

Pilot Fees same as those of Sandy Hook Pilots.

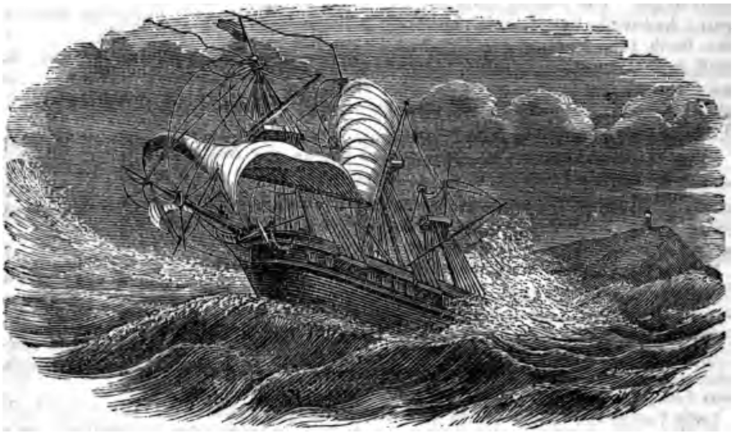
HURL-GATE PILOTAGE.

Fees.—From or to Sands' Point, for schooners or sloops, per foot, $1 50; square rigged vessels, $1 75. From or to Hurl-Gate, for schooners or sloops, $1; square rigged vessels, $1 25. From the 1st of November to the 1st of April, in addition to the above, for every ship, bark or brig, $2; for every sloop or schooner, $1.

TRANSPORTATION.

For Transportation from North to East River, and vice-versa.—A ship of the line, $20; a frigate, $15; a sloop of war, $10. All merchant vessels, $5. From Quarantine, one quarter of the inward pilotage, exclusive of the off shore. Hauling into the river from the wharf, $3.

Pilot boats holding commissions are numbered and designated by a square burgee, with white centre and blue border, the number being in the centre.



DISASTERS AT SEA.

We shall hereafter furnish, monthly, as full and correct a list of Disasters at Sea as it is possible to compile. Shipowners, underwriters, and masters, may, therefore, look to the Nautical Magazine for a complete and concise record of maritime disasters.

STEAMERS.

Eagle's Wing, left Boston, Feb. 14, for New-Bedford, not heard of since.
James Robb, (steamboat,) sunk by the ice, on Ohio River.
Dresden, (steamboat,) sunk by the ice, on the Ohio River.
Northerner, (steamboat,) sunk by the ice, on the Ohio River.
Norma, (steamboat,) sunk by the ice, on the Ohio River.
Grand Turk, (steamboat,) sunk by the ice, on the Ohio River.
Latrobe, (steamboat,) sunk by the ice, on the Mississippi River.
Helen Mar, (steamboat,) sunk by the ice, on the Mississippi River.
Winfield, (steamboat,) sunk by the ice, on the Mississippi River.
Cincinnatus, sunk by the ice, on the Mississippi River.
Joseph Johnson, (steam-tug,) March 9, was run into by schr. Henrico, lost one wheel, smoke-pipe, &c.
Isabel, got upon the Sand Key Shoal, at Key West, Jan. 22, got off again.
Cahawba, New-York to New-Orleans, shipped a heavy sea, carried away starboard forward life-boat.
America, (steam-tug,) was in distress, off Cape May, by the floating ice.
Southerner, ashore 20 miles from Cape Classet, Pacific Coast, passengers and mails saved.
North Carolina, Phil. for Liverpool, broke her propeller, and returned to Philadelphia.

SHIPS.

Favorite, New-Orleans for Boston, went ashore, Jan. 29, on S. Breakers, off Salem, a total loss.
Algoma, New-York for Hampton Roads, was seen off Cape Henlopen, Jan. 23, leaking badly.
Woodbine, Cardiff for Portland, in coming out of Cowes, Jan 13, grounded, got off safe.
Spirit of the Times, Tongoy for Baltimore, lost foremast, bowsprit, and other spars.
New World, at Liverpool, touched on a rock, off the Skerries, apparently not damaged
Gray Eagle, for Rio Janeiro, returned to Philadelphia, was cut through by floating ice.
Holyoke, St. John's, N. B. for Dublin, got on the sunken rocks near the Tuskar Light.
Inchinnan, Hong-Kong for San Francisco, returned, Nov. 27, in distress.
Two wrecks seen about 3 miles apart, 10 miles N. W. from Cape Cod, sea breaking over them.

Alexander, St. Ubes for Baltimore, lost main topgallant-mast, sprung main-mast head.
Raven, (clipper,) at San Francisco, lost head and cutwater, off Cape Horn, in a strong gale.
Witch of the Wave, (Br.,) was abandoned waterlogged, off Sambro Head 56 miles.
Rober Syers, (Br.,) burnt at Sydney, N. S., Nov. 6, nothing saved.
Revenue, at Boston from Calcutta, in collision with schr. Rose, started cutwater, lost jibboom. The schooner lost mainmast, had quarter-deck stove, but did not leak.
Star King, from Chinqua Island, in putting into St. Thomas, struck reef and lost false keel.
Satira Morse, ashore at Troon, Scotland, has been got off for repairs.
Frank Pierce, at Boston for Liverpool, split sails, washed away bulwarks. &c.
Spark of the Ocean, New-York from New-Orleans, in contact with the Telegraph, from Boston for San Francisco, 24th December. Former lost foreyard and jibboom, started stem and stove bow; the latter lost fore-topmast, fore-yard and jibboom, &c., hull not supposed to be injured.
Argonaut, at Hong-Kong from Boston, had been ashore on a reef, Straits of Lombock.
George Maugham, Philadelphia for St. John's, N. F., put back leaking, cargo flour, partially damaged.
Thomas H. Perkins, at Nassau, leaking, will proceed on her voyage.
H. M. Hays, New-Orleans for Liverpool, put into Norfolk, leaking badly.
Phantom, at Gibraltar, Jan. 18, with bows damaged, in collision with a barque.
Gazelle, at Hong-Kong from San Francisco, dismasted, 10 feet water in hold, 5 upper deck beams broken, sixteen passengers drowned between decks, was hove on beam ends, Nov. 19, Lat 21° N., Lon. 141° E.
Alfred, at Hong-Kong, put back in distress.
Isaac Newton, Calcutta for Boston, put into Mauritius in distress, hull and spars damaged.
Timoleon, at St. Thomas in distress, proceeded to New-Orleans for full repairs.
Mary Merrill, put into Charleston, 12th Feb., lat. 28 40 N., lon. 72 10, came in contact with a sunken vessel, level with the sea, damaged bow, and sprung aleak.
Cornelia Laurence, New-York for Liverpool, strained ship, choked pumps, and returned.
Sir Robert Peel, New-York for London, lost sails, rudder-head, one man, &c.
John W. Gossler, at Port Discovery, Puget's Sound, leaking.
Galloping Tiger, of Madison, (Conn.,) a total loss, at Old Field, near Setauket, L. I., March 9.
Unknown, (large,) ashore on Manzanilla Reef, Feb. 26.
Ianthe, San Francisco for Hong-Kong, put into Ladrone Islands, leaky, Dec. 14, 1854.
Bombay, Liverpool for Savannah, abandoned, Jan. 31, lat. 48 N., lon. 15 W., leaking badly.
Witch of the Wind, for Liverpool, was abandoned, Jan. 20, 90 miles N.N.E. of Halifax.
Nathaniel Hooper, for Baltimore, Dec. 31, sprung aleak, lat. 32 N., lon. 70 W., and abandoned.
Revenue, Liverpool for New-Orleans, Feb. 6, struck on Tuscar, and went into Sicily.
Arethusa, in contact with a French brig on N. E. coast of Jaica.
Ebenezer, from New-York, put into Lisbon, lost spars, sails, bulwarks, rail, &c.
Jo, at Fayal for Boston, was wrecked in getting under weigh, Jan. 23.
Henry Cooke, for New-Orleans, put into Cork leaking, Feb. 10.
Sebago, (new,) at Mobile from Portland, lost main togallant-mast.
Hudson, Savannah for Boston, went ashore on Brewster Flats, Cape Cod, March 9.
John Rutledge, for Liverpool, was seen, March 11, on her beam ends, had lost all sails bent, &c
Russell, at New-York from Havre, damaged spars, sails, and rigging, March 14.
Hendrick Hudson, New-York for London, foundered at sea, March 12, two men lost.
Masonic, at New-Orleans from New-York, was run into by a ship, lost bowsprit, &c.
Pawtucket, New-York for Portland, got ashore on Sandy Neck, near Barnstable, March 10.
Celestial, at Boston from Apalachicola, lost sails, jibboom, &c., March 10.
Heaver, from New-Orleans, ashore on the Rising Rocks, Bahamas, about 6th of March.
Unknown, ashore on the Grand Bahama Bank, a total loss.
Jabez Snow, at New-Orleans from Liverpool, lost sails, &c.
Surprise, at New-York, from Shanghae, much damaged in spars, &c.
Seaman, New-Orleans for Marseilles, February 6, struck by lightning and consumed, crew escaped.
Lorenzo, at Baltimore from Liverpool, lost one man overboard, Feb. 19.
Unknown, (800 tons,) was passed off Stirrup Key, Feb. 17, bowsprit, and head of foremast gone.
H. M. Hays, New-Orleans for Liverpool, was seen, March 8, in a bad situation, lat. 33 12, lon. 79 40, both pumps going.
New-England, New-York for Savannah, got ashore on shoals at Tybee, March 1.
John Land, Boston for San Francisco, is at Tahiti, will probably remain there.
Amelia, at New-Orleans from Rio Janeiro, Feb. 26, lost a suit of sails, some spars, &c.
Light-Ship, on Middle Ground, Setauket, has slipped her cables, or been drifted away.
W. A. Cooper, Savannah for Boston, March 10, lost on Fourth Cliff, Scituate, three of her crew lost.
Lady Arabella, at Portsmouth, Va., had cabin burnt up, March 7th.
Aquetnet, Valparaiso for London, ashore at Montigo, Panama.
Unknown, (entirely iron,) was seen abandoned, Oct. 6, lat. 26 52, lon. 41 48.
Empire, New-York for Liverpool, Feb. 24, got ashore at Sandy Hook, but soon got off.
Union, at New-Orleans from New-York, Jan. 26, damaged spars, sails, &c.
Nuremberg, was in contact with a brig, Feb. 1, 30 miles S. W. of Start Point; brig lost foremast and bowsprit.
William, New-York for Malaga, went ashore at Estepona, Mediterranean.
Mediator, New-York for New-Orleans, was ashore near Charleston, S. C., Feb. 14, and got off again.
Java, at New-York from Glasgow, was damaged in hull and sails.

BARQUES.

Ann & Mary, at Boston, from New-Orleans, lost sails, &c.
Charles S. Olden, Port-au-Prince, for Philadelphia, went ashore Jan. 25, five miles south of Fenwick's Island.
Apollo, Venice, for Messina, grounded in entering the harbor of Girgenti.
Jane A. Falkingburg, at San Francisco from Boston, lost sails, spars, &c., off Cape Horn.
Wm. W. Harris, in contact with barque Celestia, 25 miles north of Cape Cod, and sunk, 1 man lost from the Celestia, and she much damaged.
Formosa, Smyrna, for Boston, was totally wrecked Jan. 5, near Messina.
Sarragossa, N. O., for Phila., sprung a leak, 2 days out, and returned to N. O. for repairs.
Golden Era, at New-York, from Shields, split sails and shifted cargo in heavy gales.
Active, at Baltimore, from Darien, lost part of deck load of lumber in a heavy gale.
Maryland, Palermo, for Boston, ashore on Ipswich Beach, crew saved, vessel and cargo may be lost.
Cape Horn Pigeon, (whaler,) at Talcahuano Dec. 15, lost bowsprit, jib-booms, top and top-gallant masts, with sails and running rigging.
Flight, from Savannah, ashore near New Inlet, got off and was towed up to New-York.
Hamilton, at New-Orleans, lost foretop-sail and jib in heavy gales.
Victory, New-York, for St. Thomas, sprung a leak, foundered lat. 19 36 N., lon. 63 W., crew saved.
George E. Webster, at San Francisco, from Hong-Kong, lost sails, damaged hull and rigging.
Frederick Deming, put into Norfolk in distress, repaired and sailed.
Blythewood, (br.,) wrecked near Lewes, del Albioni, at New-York, from Palermo, stove bulwarks &c., in heavy weather.
Orion, at New-York, from Talcahuano, Sept. 5, lat. 45 S., lon. 82 20 W., struck by heavy sea, lost bulwarks and stanchions, house on deck, split sails and planksheer.
Burlington, New-York, from Leghorn, in East River came in contact with barque E. Sherwood, stove in barque's starboard bulwarks, &c., E. S. lost jib boom.
Milton, Galveston, for Antwerp, arrived 28th Jan., in distress.
California, New-York, for Boston, went ashore near Maronett Point, Mass., one man lost.
Edisto, Charleston, for Boston, went ashore March 9, on the Orleans beach.
Murillo, New-Orleans, for Boston, ashore near Nauset Lights, both masts gone.
William, from New-York, drove ashore west of Marbella, (Mediterranean,) Jan. 27.
Investigator, Greenock, for New-York, was abandoned lat. 47 20, lon. 38 40, with 8 feet water in hold.
Gambia, at New-York, from Cardenas March 10, lost some spars, sails, deck-load, &c.
Sophronia, at Talcahuano, from Boston, lost bulwarks, caboose, &c.
Heroine, (whaler,) of Honolulu, lost Jan. 8, in leaving Honolulu.
Lucy Ring, at Mantanzas, from Havana, in contact with brig Manzonia, lost jib-boom, &c.
Nancy Treat, of Frankford, was fallen in with lat. 29 11, lon. 79 40, waterlogged and abandoned.
Elizabeth J., at Philadelphia, for Pernambuco, lost jib-boom, &c.
C. B. Truitt, New-York, for Philadelphia, put into Nassau, lost one man, and 3 or four feet water in hold.
Unknown vessel, drifted ashore at Long Bay.
Morning Star, from New-York, went ashore Feb. 9, 3 miles west of Pass à L'Autre.
Reindeer, at New-Orleans, from New-York, Feb. 8, lost some spars and sails at the Hole-in the-Wall.
Southerner, New-York, for Cadiz, put into Newport, R. I., Feb. 25, leaking 700 strokes.
James Smith, from Surinam, put into Holmes' Hole Feb. 22, leaking badly.
Ionic, Matanzas, for Portland, put into Salem in distress.
Rolla Sagua, for New-York, put into Norfolk, leaking, lost deck-load and sprung masts.
Harriet Chipman, Trinidad, for New-York, Feb 13, ran into Key West, in distress.
Georges, at New-York, from New-Orleans, lost deck-load, sails, &c.
Mary Morris, at New-York, from Glasgow, lost bulwarks, &c.
Several vessels were seen ashore between Cape Hatteras and Cape Henry, about 1st March.
Ida, Messina, for Boston, got on shore on East Chop, Holmes' Hole, Feb. 28.
William, New-York, for Malaga, got ashore between Gibraltar and Malaga, Jan. 27.
Macon, Boston, for Mobile, went ashore Feb. 19, near Grand Gossier.
Lysander, Cienfuegos, for Boston, put into Provincetown, with loss of all topmasts, March 4.
Kate & Alice, at New-York, from Palermo, much injured in a gale, and leaking badly.
Ann, from New-Orleans, for New-York, ashore on the flats above Robbins' Reef.
George Warren, at New-York, from New-Orleans, March 9, lost part of deck-load.
Franklin, of Portland, is reported as a total loss.
California, at New-York, from Rio Janeiro, lost head-rails, &c.
Mangola, Marseilles, for Trapani, totally lost near Trapani.

BRIGS.

Washington, Cardenas for Portland, at Holmes' Hole, lost 30 hhds. molasses.
Tiberius, at Holmes' Hole, lost 190 bbls. molasses in a gale.
Shackford, ashore 3 miles W. of Highland Light, leaks badly, may be saved.
Avon, Norfolk for Marseilles, lost fore and main topmasts, off Willoughby Light
Citizen, Machias for New-York, capsized about 60 miles S.S.E. of Cape Ann.
George Washington, Sierra Morena for Portland, got aground in Vineyard Sound, March 9

Manzanilla, Cardenas for Boston, got ashore on the Middle Ground, Vineyard Sound.
H. P. Cushing, Havana for Boston, was seen dismasted, March 10, off the Monument.
Civilian, Sagua for Boston, went ashore near Highland Light, Cape Cod, March 9.
Cyrus, Vancouver's Island for San Francisco, got ashore, Jan. 28, on Vancouver's Island.
R. Speer, Portland for Havana, totally lost on Dog Rock, Salt Key, Feb. 27.
R. W. Packer, at New-York from Gonaives, lost sails, deck load, &c.
Galena, at New-York from Frontera, Tobasco, sprung aleak, lost bulwarks, sails, &c.
Mary Eleanor, Halifax for St. Jago, put into St. Thomas, March 4, and condemned.
Commerce, Philadelphia for Providence, ashore at Sandy Hook.
Elmir, when off Barnegat, ran into the deck cabin of a vessel painted yellow.
United States supply vessel, Guthrie, lat. 40 45 N., lon. 72 10 W., came in contact with unknown brig, carrying away fore and main rigging, stanchions, bulwarks, foresail, &c., saw no more of brig.
Motto, Portland for Matanzas, ashore back of Cape Cod, got off leaking badly.
Baltic, (Bri.,) at New-York from St. Thomas, had a collision in the Narrows, broke stanchions, &c.
Extra, put into Havana, loss of sails, rigging, leaking badly, would be repaired.
Angostura, with hides, ashore at New Inlet, Rockaway Beach, may be got off.
Torno, totally lost between the Pelican Cays, Abago, cargo saved.
Potosi, wrecked off Abago, part of wreck drifted ashore.
R. Russell, ashore off the Big Gap, St. George's Island, Florida, a total loss.
Duncan, at Savannah from New-Orleans, lost part deck load, sails and bulwarks.
Lodebar, from New-Orleans at Charleston, lost deck load, sails and rigging.
B. L Swan, at New-Haven from St. Croix, lat. 36 30, lon. 71 30, fell in with wreck of R. D. Merriam.
Ormus, at New-Bedford from New-York, was run into by propeller Westchester, also by a schooner.
Lady of the Lake, put into Gloucester in distress, leaky, lost deck load.
Tyrone, at Berwick's Bay, Lou., was destroyed by fire, total loss.
Baltic, lat. 35 50 N., lon. 74 30 W., abandoned, dismasted, &c., was cotton loaded.
Gen. Taylor, Wilmington for Boston, struck on Cape Lookout Shoals, abandoned leaking.
Marcellus, New-York for Jacksonville, by collision, lost all spars but mainmast, condemned and sold.
Wm. H. Stewart, at Baltimore from New-Orleans, split sails, lost head rails, &c., in heavy weather.
Arcturus, New-York for Windsor, N. S., was lost near St. John's, N. B., crew saved.
Glencoe, at San Francisco, lost and split sails.
Unknown, abandoned at sea, 39 30 N., 34 27 W., about 250 tons.
Pembroke, Aux Cayes for Boston, towed into Bermuda, lost deck load, sails, jibboom, &c.
Parthenon, at Havana, in distress.
Elizabeth, (Br.,) valued at $16,000, lost at Seituate, Me.
Gustavus, ashore at Turk's Island, at N. end of Salt Cay, a total loss.
Whitaker, from Calais for New-York, ashore at North River, Marshfield, Mass., has got off.
Crocus, put into Wilmington in distress, loss of sails, &c.
Humboldt, ashore 5 miles S. of Squan Beach.
Rush, of Portland, lying at anchor in North River, N. Y., had bows stove by ice, sunk, two crew lost, cargo molasses lost.
E. W. Denton, at New-York from Port-au-Prince, split sails, lost deck load, &c.
Judge Hathaway, Laguna for New-York, put into Charleston, March 8, had sprung aleak and lost sails.
Duncan, at Savannah from New-Orleans, lost sails, bulwarks, &c.
Matthew, Wilmington, N. C., for Liverpool, put into Brookhaven, Feb. 4.
Shackford, Alexandria for Boston, went ashore near Highland Light, Provincetown, Feb. 17.
Juno, totally wrecked at Coos Bay, Oregon.
Damariscotta, totally wrecked on S. Sand Spit, Umpqua River, Oregon, Jan. 24.
Tarry Not, Cape Haytien for Boston, put into Holmes' Hole, February 26, lost part of deck load.
Chinchilla, in contact with an herm. brig, one day out of New-York, brig supposed to have foundered with all hands.
Unknown, was passed, Feb. 5, lat. 36, lon 66 30, dismasted and abandoned, about 300 tons.
Potomac, totally lost on Sandy Island, mouth of Columbia River, Jan. 28.
J. B. Lunt, ashore at Woody Island, Columbia River.
Waitstill, at New-York from Attakapas, lost sails, &c
Prentiss Hobbs, at New-York from Sagua, lost some spars, &c.
Nancy Plaisted, at New-York from Frontera, Tabasco, leaky, &c.
Lucy Ann, at Boston from Cardenas, lost deck load, sails, &c., on 21st Feb.
Maria White, Sagua for New-York, got ashore at mouth of Sagua Harbor.
Abrasia, at New-York from Alvarado, lost bulwarks, &c.
L. W. Armstrong, Hebo, (P. R.,) for New-Hampshire, ran into New-York in distress.
Marcia, Bath for Havana, put into Boston, March 8, in distress, leaking badly.
Helen F. Ryder, Pernambuco for Boston, put into Norfolk, March 8, leaking, and with loss sails.
Julia Payson, for New-York, ashore at Cape Henry, March 10.
Caroline, at New-York from Attakapas, lost part of deck load and stove boats, March 10.
Chatsworth, at New-York, from Para, lost sails, stove boats, &c.
Sarah Bernice, at New-York from Porto-Rico, lost cutwater and figure-head.
Samuel J. Hends, of Bristol, Me., was fallen in with, March 13, in a sinking conditi
Civillian, Sagua for Boston, is ashore west of the Highland Light.

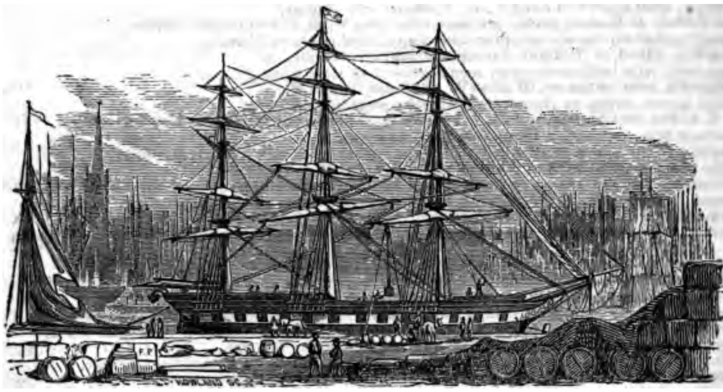
SCHOONERS.

Caroline Grant, Cardenas, for Boston, went ashore near Billingsgate Light, March 9.
Emperor, from Madison, Connecticut, totally lost on Milford's Ledge, L. I., March 10, but one man saved.
G. B. Challoner, at New-York, from Guayma, P. R., lost sails, stove boats, &c.
Governor Anderson, Feb. 17, in collision with a Bremen vessel, and much injured in hull, sails, and rigging.
Eliza Frances St. George, Maine, for Mantanzas, put into Norfolk March 12, with loss of anchors.
Charles & Edward, at Norfolk, from Boston, lost sails, and anchor and chain.
Evelina, went ashore in Provincetown Harbor March 10, lost anchors and chains.
Lewis Walsh, at Boston, from Baltimore, lost sails, bulwarks, stove boat, &c.
Unknown, (150 tons,) was seen March 13, 7 miles N. N. E. of Nantucket Great Point Light, abandoned, crew supposed lost.
Samuel Lewis, New-York, for Alexandria, lost sails, spars, and leaking.
Solon, Norfolk, for Camden, got on the rocks in going into Portland, March 13, afterwards sunk.
Mobile, at Providence, from Mobile, lost sails, stove boat, &c.
Oliver H. Perry, for Jacksonville, went ashore at Currituck Sound, N. C., a total loss.
Richard A. Wood, at Baltimore, carried away foremast, damaged sails and rigging.
Unknown, sunk in L. I. Sound, all hands lost, supposed to have struck a rock.
Lafayette, Baltimore, for Hill's Landing, sunk in Patuxent River, crew saved
Emma, at Charleston, loss of foretopmast, jib-boom, &c.
Elvira, ashore at Little Machia's Bay, Maine, bilged and became a total loss.
Marietta, at Bermuda, in distress, leaking, loss of sails, &c.
Athos, at Turk's Islands, leaking badly, condemned and sold.
German, went on the rocks at Cutler, Maine, crew saved.
Ottawa, at Richmond, from Cardenas, lost sails, sustained other damage.
C. C. Stratton, at Wilmington, N. C., split jib and lost boat on passage.
About 70 sail are ice and weather-bound near Lewes, Del., some vessels will be lost.
Eliza Jane, ashore inside the pitch of Cape Henlopen, vessel and cargo saved.
Merak, ashore outside the Capes, will be lost, cargo saved, in bad condition.
U. S. schooner Madison, of the coast survey, at Savannah, with foremast sprung, stern-boat
Maria Jewett, ashore on Deal Beach, N. J., crew saved, cargo logwood and coffee.
Isaac Tunnell, Mobile, for Cienfuegos, put into Galveston leaky, lost deck load.
C. L. Allen, ashore 15 miles S. Cape Henry, cargo ice and fish from Rockland.
Chronometer, bound for Naples, Italy, abandoned lat. 45 N., lon. 12 W., crew saved.
Black Monster, 25 miles S. Cape Henry, loss of sails, crew frost-bitten, towed into Norfolk by the pilot-boat Reindeer.
Harriet Newell, Halifax, for City Point, put into Norfolk in distress, lost sails snd spars.
William P. Williams, ashore on Sandy Hook, total loss.
Manomet, at Norfolk, foremast sprung, deck-load lost, leaking badly.
Nantucket Light Ship, broke adrift, lost on Montauk Rocks.
Lightfoot, Boston, for Mobile, put into Nassau leaking, was condemned.
Hattie Annah, ashore at Hawk's Nest, in the Delaware, slighily damaged, crew safe.
Elizabeth Arcularius, Rockland to Galveston, with lime, put into Nassau, leaking, and cargo on fire.
Harriet Ann, St. John's, N. B., to Lubec, totally lost on Grand Menan.
Havana, at Charleston, from Plymouth, N. C., damaged hull and sails in gales.
Robert Morrisy, sunk by ice off Schuylkill River, Delaware Bay.
Castello, Boston, for Jeremie, went ashore in Jeremie Harbor, Nov. 30, a total loss.
J. H. Roscoe, at New-York, from Jacmel, lost deck-load, stove bulwarks, &c.
Unknown vessel, ashore at Jeremie, Jan. 9.
Greyhound, Santa Cruz, for Antwerp, was totally wrecked.
Hudson, Franklin, Lou., for New-York, put into Newport in distress, Jan. 31, lost sails, bulwarks, &c.
Mary Anna. put into Lewes, Del., lost mainmast Jan. 28.
Col. Satterley, New-York, for Charleston, lost sails, &c.
Rhode-Island, Hyde County, N. C., for Charleston, Jan. 21, lost sails, &c., put into Wilmington, N. C.
E. H. Rowley, at Philadelphia, from Jacksonville, lost spars, sails, &c., Jan. 26, struck by lightning, shivered mainmast.
David Faust, at Philadelphia, from Wilmington, N. C., Jan. 28, heavy weather, lost 3 men.
Major Donaldson, at Baltimore. from Attakapas, lost part of deck-load of molasses.
Onward. at Wilmington, from New-London, lost anchor chains, boat, &c., Jan 21.
Storm King, at Charleston, from Baltimore, lost spars. sails, bulwarks, and leaking badly.
Senator, New-York, for Boston, ashore on L'Hommedieu shoal, Vineyard Sound, Feb. 2.
Pearl, ashore on Rockaway Beach, may possibly be got off.
Solo, Savannah, for New-York, wrecked on Ocracoke shoals, cargo 17 tierces rice.
Amazon, Cherrystone for Richmond, was sunk by a steamer, and the captain drowned.
Francis A. Goodwin, New-York for Washington, N. C., lost foremast with rigging.
Belle, Baltimore for Portland, stove boat, shifted cargo, &c.
Miranda, Norfolk for Cardenas, has become a total loss.
John Bell, Richmond for Boston, ashore near Dennis.
Telegraph, towed into Hyannis, March 12, with loss of both masts.
Yarmouth, Boston for Yarmouth, March 9, drove ashore at the Common fields.
M. E. Wells, at Charleston from New-York, lost sails.

J. E. Bowley, Norfolk for Boston, is ashore at Barnstable Bay.
Lillie Rich, Boston for Wellfleet, ashore at Barnstable, masts gone.
Hutoka, Norfolk for Boston, lost on Peaked Hill, Bass Race Point, all hands perished.
Ohata, Boston for St. Thomas, got ashore on Long Point, Provincetown Harbor.
Evelina, went ashore on Long Point, Provincetown Harbor.
Col. Totten, an Eastern packet, got ashore on Long Point, Provincetown Harbor.
Several unknown vessels ashore at Long Point, Provincetown Harbor.
Magellon, Cloud, at Newport, damaged in hull, spars, sails, &c.
Unknown, with both masts gone, seen 9 miles S. of Cape Cod.
Unknown, seen bottom up, 20 miles W. of Mount Desert, Me.
Naiad Queen, struck on Nantucket Bar, and started her garboard.
G. C. Gibbs, for Charleston, S. C., ashore on Keys Sombrero, Florida Reef, got off safe.
Morning Star, capsized in Barnstable Bay, crew saved.
Alcyona, Wilmington, N. C., for Philadelphia, ashore near Chincoteague, March 11.
Solon, from Norfolk, sunk in Portland Harbor, March 13.
Unknown, 100 tons, ashore on Great Round Shoal, Nantucket, and going to pieces.
James, Newburyport for Philadelphia, dragged ashore, March 10, at Holmes' Hole.
Eunice H. Adams, Nantucket for New-Bedford, dragged ashore at Holmes' Hole, March 10.
Smith Tuttle, Boston for New-York, went ashore, March 10, at Warren's Cove, Plymouth Beach.
Benjamin, Eastport for New-York, went ashore, March 10, at Warren's Cove.
Unknown, ashore, March 12, in Manomet Cove, near Plymouth Light.
Union, Duxbury for Boston, dragged ashore near Plymouth.
Lightfoot, Boston for Mobile, sprung aleak in a gale, 11th Feb., leaking 20 in. per hour.
Robert Morris, Lewes, Del., for Philadelphia, sunk by the ice off mouth of Schuylkill River.
Lejok, Attakapas for Philadelphia, lost on Cape Henlopen, Feb. 14.
Unknown vessel, 190 tons, was seen bottom up, Jan. 31, 20 miles W. of Mount Desert.
Unknown, was passed, Feb. 17, 9 miles N. of Cape Cod, both masts gone.
Magellan, Cardenas for Portland, much damaged in hull, spars, sails, and rigging.
Lamartine, at Wilmington from New-York, was considerably damaged.
El Dorado, at Wilmington from New-London, lost sails, sprung masts, &c.
Autumn, New-York for Norfolk, Feb. 21, got ashore on Indian River Bar, Del.
Robin, New-York for Attakapas, Feb. 14, was ashore on Robinson's Reef, near Bird Island.
Banner, Newcastle, N. H., for Boston, got ashore, Feb. 22, in Portsmouth Lower Harbor, and bilged.
Unknown, 200 tons, was passed, Feb. 22, off Phenix Island, bottom up and rudder gone.
Mecca, Eastport, for Baltimore, lost deck-load of 50,000 feet lumber, off Moosepecca.
White Squall, Baltimore, for New-York, went ashore Feb. 27, on Romer Shoal.
J. H. Chadbourne, Wilmington, N. C., for Boston, went ashore on Absecom Bar, Feb. 26.
Visscher, Boston, for Wiscasset, a total loss on Pumpkin Island Ledges, Feb. 23.
Unknown, (three-masted,) was seen ashore on Absecom Beach, Feb. 23.
W. A. Spofford, at Charleston, for New-York, had rudder sprung.
Mary Jane, Attakapas, for New-York, put into Charleston, 3 feet water in hold, on Feb. 23
Rose, Baltimore, for Demarara, was run into by a ship, lost 1 man, mainmast, &c.
Unknown, was passed masts 10 feet above water, Feb. 28, lat. 27 20, long. 72 56.
Martha Jane, New-Orleans, for Texas, a total loss, 3 miles above Aransas River.
Major Barbour, New-Orleans, for Texas, ashore on Aransas Bar, Feb. 12.
Emma Louisa, Aransas, for Galveston, a total loss, about 7 miles above Aransas Bar.
L. C. Watt, at New-York, from New-Orleans, Feb. 21, lost boat, deck-load of molasses, &c.
W. A. Spafford, from Bayport, Flo., put into Key West in distress, had been ashore.
Kalos, at Baltimore, from Eastport, lost bulwarks, deck-load, &c.
A. L. Hyde, Eastport, for Baltimore, returned with loss of foremast, deck-load, sails, &c., on 20th Feb.
Judge Baker, Shallotte, for New-York, put into Wilmington, N. C., for repairs, March 3.
Anita, Damon, Norfolk, for Boston, went ashore near the Fourth Cliff, Scituate, March 9.
Unknown, ashore, near the Gournet Light, Plymouth.
Blooming Youth, Baltimore, for Matagorda Bay, put into Norfolk, March 8, dismasted.
Mountain Wave, Boston, for San Francisco, put into Rio Janeiro for repairs.
Spring Bird, New-York, for Portland, totally lost at Sandy Point, Chatham, Mass, March 8.
Leo, Boston, for Norfolk, went ashore Feb. 23, at Willoughby's Point.

Fast Towing. — The fine steam-towboat Enoch Train, Capt. Hennessy, made a trip from Boston to Portsmouth, N. H., a few days since, averaging fourteen miles an hour the whole distance. On her return, with a large clipper ship in tow, she averaged nine and a half knots.—*Ex.*

Commercial Department.



THE RECIPROCAL TIMBER TRADE OF THE UNITED STATES AND BRITISH NORTH AMERICA.

Whenever commerce receives a fresh impetus, its beneficial effects accrue not only to the countries interested, but to the world. Its advancement, therefore, becomes the object of a wise and philanthropic policy, no less than one of great national interest.

The lively desire now generally manifested to appreciate the advantages of the recent treaty of free and unrestrained commerce between the United States and British North America, has led us to make some remarks upon the extent and value of the timber trade between those countries, especially that portion of it which is consequent upon the manufacture of shipping, and which does not appear to have commanded much attention. A single glance at the geography of the British Colonies will be sufficient to discern the fact, that these finely timbered regions are but an extension of our own New-England forests, whose varied and valued productions, differing, as they do, so widely in character and uses, may be fairly exchanged for those of more southern latitudes, since each has its own peculiar advantage in application to mechanical purposes. As it is with the coals of the two countries, so it is with the timber. From Nova-Scotia and New-Brunswick, we may obtain the soft

bituminous description, while these Provinces require from us, for the use of steamboats and foundries, large quantities of anthracite, which nature has not provided to their hand. For the great purposes of ship-building, especially do we find it mutually advantageous to exchange our white and live oak, pitch pine, locust, and lignum vitae, for their hackmatack, white pine, and spruce, as staple articles of consumption. In St. John, New-Brunswick, alone, during the year 1851, no less than 4,228 tons of pitch pine timber, 211,000 locust treenails, and 21 tons of lignum vitae, were imported from the United States. In that year 60 vessels, averaging 477 tons each, were built at that port; and 87 suoh vessels, in all, were built in that Province the same year. In 1853, there were built in New-Brunswick, 115 vessels, averaging 605 tons each, consuming in their construction a proportionate amount of American timber. The demand for pitch pine, oak, locust, hickory, and black walnut, and many kinds of cabinet wood, none of which are found in these Atlantic Provinces, will be greatly increased under the operation of free trade influences, which the late treaty secures.

Stimulated by the example of American builders, a great improvement in the model and finish of New-Brunswick built ships has been prominently visible within the past five years; and their value has been proportionately augmented in the British market. Hackmatack, or as it is sometimes denominated, tamarack timber, is now extensively used in the construction of New-Brunswick shipping; and this wood has been so highly approved by commercial men, that, in 1850, the Committee of Underwriters, at Lloyd's, Eng., decided to admit hackmatack vessels to the red star class for six years. In three years thereafter the same committee further resolved to admit these vessels to the *seven* year class. The resolution is in these words:

"Hackmatack, tamarack, juniper, and larch, of good quality, free from sap, and not grain-cut, will be allowed in the construction of ships in the seven year class, for the following parts: floors, first, second, and third futtocks, and top timbers, stem and stern post, transoms, knight-heads, hawse-timbers, apron and dead-wood."

Although the free navigation of the river St. John was guaranteed by treaty to American citizens, for the purpose of floating the forest productions of that portion of the State of Maine through which its branches flow, to the ocean, an export duty has been levied on all such productions passing down this river to the United States, as follows: on every ton of white pine timber, 20 cents; on every ton of spruce, hackmatack, or hardwood timber, masts or spars, 15 cents; and the sum of 20 cents on every thousand feet of saw-logs, or lumber.

The extent of this incumbrance upon the industry of our own people, and which the late treaty of reciprocity removes, may be estimated from the following statement of the quantities of timber and lumber which was floated down the St. John River during the season of 1852:

100,000 tons white pine timber, at $6 per ton,	$600,000
10,000 tons hackmatack timber, at $7 per ton,	70,000
50,000,000 white pine logs, at $6 per thousand,	300,000
20,000,000 spruce logs, at $5 per thousand,	100,000
5,000,000 pine boards, at $15 per thousand,	750,000
15,000,000 cedar and pine shingles, at $3 per thousand,	45,000
5,000,000 pieces clapboard, at $16 per thousand,	80,000
Total,	$1,945,000

The value of the above forest productions now floated down the river, from the territory of Maine, will doubtless reach figures much higher than those of 1852, and may be estimated at two and one half millions of dollars. Thus, it will be seen, that our ship and house builders have been relieved from an onerous tax, and a stimulus afforded to the industry of our own citizens.

The larch, or hackmatack timber tree, which abounds in all the territory watered by this magnificent river, and which is navigable for 80 miles from the harbor, is held in equal repute by the ship-builders of the United States and Great Britain. So great was the quantity of this wood carried out of New-Brunswick, into Maine and Massachusetts, for the construction of ships in 1850, that the Legislature of the Province became alarmed, lest their own ship-yards should fall short of a supply; and a special export duty was, therefore, imposed on knees,

futtocks, and floor-timbers, when shipped to the United States. This act was suspended after a few years; and under the new treaty, we may look forward for an increasing and valuable exchange of forest productions, consumed in ship-building, to spring up between Canada, New-Brunswick, Nova-Scotia, and Prince Edward's Island, and the United States.

In addition to the supplies of pitch pine, oak and locust, the Provinces are chiefly supplied with pitch and tar from this country. Canada is the only country which produces the oak, and consequently does not require a supply from us. This invaluable wood is found in abundance in the West, while the East, or Lower Province, furnishes ample supplies of hackmatack.

Within a very few years a brisk trade in hackmatack knees, to the United States, has grown up from Prince Edward's Island, and now may be estimated by cargoes. These knees are also brought from Canada and New-Brunswick. Masts, spars, and deck-plank, may likewise be placed on the list of exchanges.

White pine lower masts, and deck-plank, may be exchanged for pitch-pine topmasts and ceiling; while spruce yards may be taken in return for locust stanchions and treenails. Indeed, the variety of exchanges are too many to enumerate, and freedom in traffic can alone demonstrate the invaluable results of placing the forests of North America side by side, as it is hoped the entire multitude of its inhabitants will yet rejoice to recognize but *one shade* under their branches, from Hudson's Bay to Darien.

New Line of Atlantic Steamers.—Mr. Vanderbilt, of New-York, has resolved to establish a new line of steamers to Havre, to consist of three ships, viz:—the North Star, Ariel, and a new ship now building at Green Point. The former ship is the well-known steam-yacht, the second is a new ship just off the stocks, and the latter is to be one of the largest vessels of her class. Mr. Collins has also projected a very large steamer, to be called the Adriatic, and is designed to surpass all former ships of his line. Let these vessels be constructed upon the *life-boat principle*, with iron keelsons and bulkheads, and give the world some tangible evidence that marine construction for passenger transit is something more than a life-trap.

THE STATE OF SHIP-BUILDING IN QUEBEC.

QUEBEC, 21st Feb., 1855.

MESSRS. GRIFFITHS & BATES, New-York.

Dear Sirs :—I have the pleasure to hand a list of the tonnage laid down since the close of the navigation of last season.

In the ship-yards, where are expected to be ready the 11 vessels for May, there is some activity; but the others show scarcely any. Again, a number of them are closed altogether, and the prospect for the whole of them is bad; that is to say, while the great war, now going on, has the effect of limiting commercial operations, the markets at Liverpool and London should not be overcharged. Very few of last season's vessels, built here, are sold, and there will be "the mischief to pay" when the net proceeds, £7 10s., are set off against the cost here and expenses at home.

The best ship to have built for market that I can see, at present, would have been a screw steamer, such as the "Prince," lost at Balaklava, must have been. Government pays 55s. per ton measurement per month, and finds the fuel. If such vessels went home, ready to receive engines, they would sell well.

Unless we do something this way (while the war continues), our ship-building must diminish very fast, our operations being based on commercial prospects at home.

Wishing you every success with the magazine,

I am, dear Sirs,

Very truly, &c.,

H. N. JONES.

Enumeration of Tonnage laid down at the Port of Quebec, under "Special Survey" of Lloyd's Officer there, with the progress made on each vessel, to date.

Builders.	Description.	Tonnage.	Class Int.	Progress.
J. Elie Gingras	Ship	850	7 years	Finished.
Ditto	ditto	950	ditto	Planked.
John Munn	ditto	1650	ditto	Finished.
Ditto	ditto	1200	ditto	In frame.
Hyppolite Dubord	ditto	638	ditto	Finished.
Ditto	ditto	1300	ditto	Just commenced.
Lomas & Sewell	ditto	1200	ditto	Discontinued.
Robert M. Cord	ditto	1000	ditto	In frame.
Charles Jobin	ditto	1100	ditto	Half in frame.
Horatio N. Jones	ditto	1270	ditto	Half planked.
Edward Trahan	ditto	1400	ditto	ditto.

Builders.	Description.	Tonnage.	Class Int.	Progress.
Andrew and Wm. Parke	Ship	1700	7 years	Half in frame.
J. B. Samson	ditto	1050	ditto	Half planked.
Rosa & Co	ditto	700	ditto	Discontinued.
Dion & Co	ditto	650	6 years	ditto.
Fortin & Co	ditto	650	ditto	ditto.
P. Valin & Co	ditto	1100	7 years	ditto.
Bridejane & Co	ditto	1000	6 years	ditto.
Thomas H. Oliver	ditto	1500	7 years	ditto.
Baldwin & Dinning	ditto	1200	ditto	Half planked.
William C. Richardson	ditto	1100	ditto	In frame.
Labbee & Co	ditto	350	6 years	Discontinued.
La Roche & Co	ditto	850	ditto	ditto.
Pierre Brunnelle & Son	ditto	1200	7 years	In frame.
Ray & Dean	ditto	1100	ditto	Half planked.
Julien Labbe & Co	ditto	1100	ditto	In frame.
William G. Russell	ditto	1100	ditto	Half in frame.
Pelchat & Mercier	ditto	1000	6 years	In frame.
Thomas C. Lee	ditto	500	7 years	Half in frame.
P. Valin & Co.	ditto	850	ditto	Discontinued.

N. B.—In addition to the above 30 vessels, there are five laid down at ports "distant from Quebec," of which, at least, three will be ready in May—altogether, 35 vessels in charge of Lloyd's officer.

Of the above, 11 will be ready by May, 9 during the summer; and, for the present, it will be seen that 10 are discontinued.

QUEBEC, 21*st February*, 1855.

SHIP-BUILDING IN ROCKLAND, ME., IN 1854.

SHIPS.

Name of Vessel.	Builders Names.	Where Built.	Tonnage
Cavalier	Achorn & Dyer	Rockland	1286.26
Yankee Ranger	Robert Trowbridge	"	707.78
Euterpe	Horace Meriam	"	1985.05
Charles A. Farwell	Sandford Stauet	"	1298.02
John Cottle	G. W. Lawrence & Co.	"	1744.48
Clarissa Bird	Cephas Starret	"	1063.93
Young Mechanic	F. W. Rhoades	"	1376 14
Louisa Hatch	William McLoon	"	853.67
Oliver Jordan	C. & N. Dyer	"	1219.35
J. Wakefield	Horace Meriam	"	1268.11
Cincinnatus	Ames & Erskine	"	1143.19
Alice Thorndike	George Thorndike	South Thomaston	847.64
——	Elisha Brown	"	967.77

BARKS.

Name of Vessel.	Builders Names.	Where Built.	Tonnage
Samson	L. D. Carver & Co.	Rockland	455.67
Rambler	Horace Meriam	"	367.29
Growler	H. P. Greenlaw	South Thomaston	484.37
Wm. A. Banks	Geo. Thorndike	"	469.62

Name of Vessel.	Builders' Names.	Where Built.	Tonnage.
Fleet Eagle	Emery, Lewis & Co	South Thomaston	380.79
Pathfinder	Hayden, Graves & Co.	"	420.54
——	McLoon & Williams	"	411.00
BRIGS.			
Enterprise	L. D. Carver	Rockland	249.79
Iris	Ceph. Starret	"	224.15
Mary Cobb	G. W. Lawrence & Co.	"	285.12
Sarah L. Dix	Stauet & Havence	"	262.—
Ann M. Weeks	James Crockett	"	198.75
——	Ellis Andrews	"	211.21
News Boy	Elisha Brown	South Thomaston	299.65
SCHOONERS.			
C. A. Libby	Horace Meriam	Rockland	238.25
Albert Jameson	Ellis Andrews	"	89.45
Lucy W. Alexander	Beverage & Waterman	"	144.54
Ella	Havener & Stauet	"	212.66
Helen	E. Brown	South Thomaston	272.46
Elvira	James Sweetland	"	174.43
SLOOP.			
Weskeag	Wilber & Newhall	"	53.00

The ships J. Wakefield, Cincinnatus, Growler, and others, were built just over the line, and within South Thomaston, but are owned in Rockland, and built by our mechanics. It is quite common for our mechanics to fit out the ships building in the vicinity for New-York and Boston owners.

For the Nautical Magazine.

SHIP-BUILDING IN ST. JOHNS, N. B., DURING 1854.

Messrs. Griffith and Bates:

Gentlemen—It is some time since I had the pleasure of communicating with you, having acted on the principle, that when a correspondent has nothing to say, it is, perhaps, the best way to keep it to himself.

A young friend of mine, a clerk in a mercantile establishment here, has, at my request, very kindly prepared the enclosed tabular statement of *all* the vessels built at and *for* St. Johns during the past year, distinguishing those built within the bounds of the port from others built in its vicinity, but actually for St. Johns ship-owners.

You can rely upon the accuracy of the list, as it has been prepared with a good deal of care. I could not obtain the consent of the compiler of it to have it published in connection with his name—an exhibition of juvenile modesty which I can hardly appreciate, as I should have been proud to adopt it; so you can insert it, with any preliminary remarks which you may deem proper.

I remain, my dear sir, very truly, yours,

St. Johns, *Feb.* 10*th*, 1855. Peter Stubs.

We are greatly obliged to our correspondent for his generous enterprise in obtaining the following list, and would respectfully

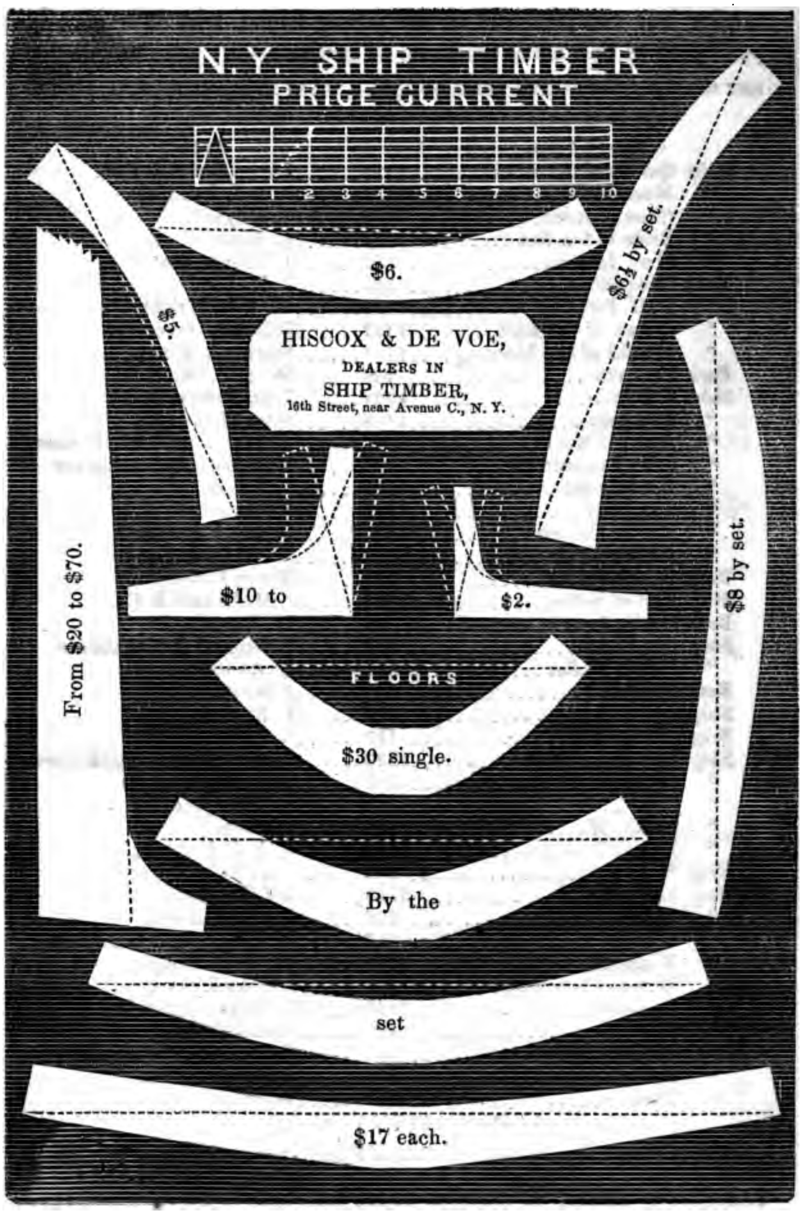
tender our compliments to his young friend, who is evidently possessed of one noble attribute of genius :—

LIST OF NEW VESSELS, AND THEIR BUILDERS, BUILT AT ST. JOHNS, N. B., DURING THE YEAR 1854.

	Vessel's Name.	Tonnage.	Builders.
Ship	Queen of the Seas	1337	James Smith & Son.
"	Morning Star	1327	F. & J. Ruddock.
"	Class Merden	1768	T. Hilyard.
"	Bride of the Sea	1344	A. Sime.
"	Wm. Jackson	986	J. Sulis & Son.
Bark	Mosquito	353	T. McLeod.
Ship	D. G. Fleming	1425	W. & R. Wright.
"	Queen of the East	1293	William Olive.
"	Herald of the Morning	1554	Storms & King.
Bark	Palmyra	706	W. & J. Olive.
Ship	J. Fernie	1037	John Fisher.
"	Pampero	1189	John Thompson.
"	Manuel Montt	560	McLaughlan & Stackhouse.
"	John Bannerman	1131	Thompson & Stackhouse.
"	Euroclydon	1325	F. Smith.
"	Shalimar	1402	J. Nevins.
"	Matias Consino	617	J. Smith & Son.
"	Gipsey Bride	1457	W. Potts & Son.
Bark	Elizabeth	430	Henry Roward.
Ship	Earl of Sefton	1081	J. McDonald & Co.
Bark	Louisa Jewett	310	W. Ring.
Ship	Sea Witch	512	Thompson & Stackhouse.
"	Ralph Waller	1087	A. Anderson.
Bark	Georgia	329	J. White.
Ship	Jessie Boyle	815	J. Rowan.
Brigt.	Margaret	177	G. Lane.
Ship	Lawrence Frost	1523	McLaughlan & Stackhouse.
"	Owangondy	1312	T. McLeod.
"	Yrca	1374	J. Thompson.
"	Sarah M	1010	A. Sime.
"	British Trident	1400	F. & J. Ruddock.
Brig	Mary Ann	262	J. Fisher.
Ship	Silistria	1218	J. & W. Olive.
"	Biobio	626	J. Smith & Son.
"	Garland	622	McLaughlan & Stackhouse.
"	White Star	2340	W. & R. Wright.
"	Witch of the Wind	1313	J. Sulis & Sons.
"	Culloden	1148	J. McDonald & Co.
"	John Linn	1473	Storms & King.
"	Simoda	642	Potts & Sons.
"	Burita	627	J. Smith & Son.
"	Themis	888	W. Olive.

42 vessels, 43,120 tons.

Built at ports and harbors in the Bay of Fundy, contiguous to, and supplied from, St. Johns, and registered there during the year 1854, 63 vessels, of 27,681 tons. Adding 42 vessels of 43,120 tons, built in St. Johns, we have a total of 105 new vessels, 70,801 tons, registered at the port of St. Johns, N. B., in 1854. Tonnage on the stocks *at St. Johns* at the end of the year, about 15,000.



A set of floors and futtocks, $9 each piece. Flitch timber, 30 to 35 cents per cubic foot; oak plank, $40 per M.; deck plank, $30 per M.; hackmatack timber, 25 cents per cubic foot; chestnut, ditto; cedar, 60 to 75 cents; yellow pine timber, rough, $25 to $35; ditto, sawed, $30; yellow pine plank, $30 per M.

KNEES.—Oak, 5 inch, $3 each; hackmatack, $1.50; oak knees, 6 inches, $5; hackmatack, $3; oak ... 7 inches, $7; hackmatack, $4.75; oak knees, 8 inches, $10; hackmatack, $7; oak knees, 9 inches, ...kmatack, $9; oak knees, 10 inches, $15; hackmatack, $10; oak knees, 10 to 12 inches, $15 to $20; ...ack, $11 to $12. Locust remains as quoted in November last.

ABSTRACT OF THE COMMERCE AND SHIPPING OF CLEVELAND, ETC.

Abstract of the Commerce and Shipping of the District of Cuyahoga, Lake Erie, for the year ending December 31, 1854.*

PORT OF CLEVELAND.

Imports coastwise, valued at	$58,487,803
Exports coastwise, valued at	33,919,629
Foreign imports, valued at	561,191
Foreign exports, valued at	469,805
Total value of Lake trade	$93,438,428

PORT OF BLACK RIVER.

Imports, valued at	$17,364
Exports, valued at	44,830
Total value of Lake trade	$62,194

FAIRPORT.

Imports, valued at	$342,086
Exports, valued at	234,757
Total value of Lake trade	$576,843

CONNEAUT.

Imports, valued at	$1,201,535
Exports, valued at	151,804
Total value of Lake trade	$1,353,339

ASHTABULA.

Estimated Lake trade	$500,000
Total Lake trade of the district	$95,930,804
Add Railroad Imports and Exports at Cleveland	23,000,000
Total trade of the district	$118,930,804

NUMBER OF VESSELS, THEIR TONNAGE AND CREWS, ENGAGED IN THE FOREIGN AND COASTING TRADE DURING THE YEAR ENDING DEC. 31, 1854.

IN FOREIGN TRADE.

	No.	Tons.	Crews.
American vessels entered	241	33,437	1,753
British " "	183	22,465	1,412
Total entered	424	55,902	3,165
American vessels cleared	205	28,569	1,547
British " "	180	22,487	1,428
Total cleared	385	51,056	2,975

* Obtained from an article in the *Cleveland Morning Leader*, compiled by S. S. Barry, Esq., commercial editor.

IN COASTING TRADE.

	No.	Tons.	Crews.
Vessels entered	2,000	930,079	36,061
" cleared	2,067	938,640	36,267
Total entered and cleared coastwise	4,067	1,868,719	72,328
Add total ent'd & cl'd in foreign trade	809	106,958	6,140
Total entered and cleared	4,876	1,975,677	78,468

NUMBER AND TONNAGE OF VESSELS BELONGING TO THE DISTRICT OF CUYAHOGA, OHIO, IN THE YEAR 1854.

Schooners	67	13,286
Scows	46	2,982
Brigs	17	4,550
Barks	5	1,913
Propellers	14	4,703
Steamers	7	4,412
Total	156	31,846

Number of vessels built in this District during 1854.......44
Aggregate tonnage........................11,063 tons.

THE EMIGRANT PASSENGER LAW,

PASSED CONGRESS, MARCH, 1855—ABRIDGED.

AN ACT to regulate the carriage of passengers in steamships, and other vessels.

SEC. 1. No master of any vessel, owned in whole or in part by a citizen of the United States, or by a citizen of any foreign country, shall take on board such vessel, at any foreign port or place, other than foreign contiguous territory of the United States, a greater number of passengers than in proportion of one to every two tons of such vessel, computing two children over one and under eight years of age as one passenger. The spaces appropriated for the use of passengers shall not be occupied by stores or other goods not the personal baggage of such passengers, shall be in the following proportions, viz: On the main and poop decks, and in the deck-houses, one passenger for each sixteen clear superficial feet of deck, if the height or distance between the decks shall not be less than six feet; and on the lower deck, (not being an orlop deck,) if any, one passenger for eighteen such clear superficial feet, if the height or distance between the decks or platforms shall not be less than six feet: but no passenger shall be carried upon any deck where the height or distance between decks is less than six feet. If any master of a vessel shall take on board, at any port or place within the jurisdiction of the United States, any greater number of passengers than in the proportion aforesaid, to the space or tonnage aforesaid, with intent to carry the same to any foreign port other than foreign contiguous territory as aforesaid, every such master shall be deemed guilty of a misdemeanor, and upon conviction thereof shall, for each passenger taken on board beyond the limit or space aforesaid, be fined in the sum of fifty dollars, and

may also be imprisoned, not exceeding six months; but should it be necessary, for the safety or convenience of the vessel, that any portion of her cargo, or any other article, should be stored in any of the decks, cabins, or other places appropriated to the use of passengers, the same may be placed in inclosures prepared for the purpose, or an exterior surface impervious to the waves, capable of being cleansed in like manner as the decks. In no case, however, shall the places thus provided be deemed to be a part of the space allowable for the use of passengers, but the same shall be deducted therefrom; and in all cases where prepared or used, the upper surface of said inclosed spaces shall be deemed and taken to be the deck from which measurement shall be made for all the purposes of this act. It is also provided that one hospital in the spaces appropriated to passengers, and separated therefrom by any appropriate partition, and furnished as its purposes require, may be prepared, and when used, may be included in the space allowable for passengers, but the same shall not occupy more than one hundred superficial feet of deck or platform: *Provided*, That on board two-deck ships, where the height between the decks is seven and one half feet or more, fourteen clear superficial feet of deck shall be the proportion required for each passenger.

2. No such vessel shall have more than two tiers of berths, and the interval between the lowest part thereof and the deck shall not be less than nine inches, and the berths shall be well constructed, and separated from each other by partitions, and shall be at least six feet in length, and at least two feet in width, and each berth shall be occupied by no more than one passenger; but double berths of twice the above width may be constructed, each berth to be occupied by no more, and by no other, than two women, or by one woman and two children under the age of eight years, or by husband and wife, or by a man and two of his own children under the age of eight years, or by by two men, members of the same family; and if there shall be any violation of this section in any of its provisions, then the master of the vessel and the owners thereof shall severally forfeit and pay the sum of five dollars for each passenger on board of said vessel on such voyage.

3. All vessels, whether of the United States or any foreign country, having sufficient capacity or space for fifty or more passengers, (other than cabin passengers,) shall have on the upper deck, for the use of such passengers, a house over the passage-way leading to the apartments allotted to such passengers below deck, firmly secured to the deck or combings of the hatch, with two doors, the sills of which shall be at least one foot above the deck, so constructed that one door or window in each house may at all times be left open for ventilation; and all vessels so employed, and having the capacity to carry 150 such passengers or more, shall have two such houses; and the stairs or ladder leading down to the aforesaid apartment shall be furnished with a hand-rail of wood or strong rope; but booby hatches may be substituted for such houses.

4. Every vessel so employed, and having the legal capacity for more than one hundred such passengers, shall have at least two ventilators, one of which shall be inserted in the after part of the apartment, and the other shall be placed in the forward portion of the apartment, and one of them shall have an exhausting cap to carry off the foul air, and the other a receiving cap to carry down the fresh air; said ventilators shall have a capacity proportioned to the size of the apartment to be purified, namely: If the apartment will authorize the reception of 200 passengers, the capacity of such ventilators shall each be equal to a tube of twelve inches diameter in the clear, and in proportion for larger or smaller apartments; and all said

ventilators shall rise at least four feet six inches above the upper deck, and be of the most approved form and construction; but if it shall appear, from the report to be made and approved, that such vessel is equally well ventilated by any other means, such other means of ventilation shall be deemed and held to be a compliance with the provisions of this section.

5. Every vessel carrying more than fifty passengers, shall have for their use on deck, at least one caboose or cooking range, the dimensions of which shall be equal to four feet long and one foot six inches wide for every 200 passengers; and in this ratio, for a greater or less number of passengers; but nothing herein contained shall take away the right to make such arrangements for cooking between decks.

6. All vessels employed as aforesaid shall have onboard, for the use of such passengers, at the time of leaving the last port whence such vessel shall sail, well secured under deck, for each passenger, at least twenty pounds of good navy bread, fifteen pounds of rice, fifteen pounds of oatmeal, ten pounds of wheat flour, fifteen pounds of peas and beans, twenty pounds of potatoes, one pint of vinegar, sixty gallons of fresh water, ten pounds of salted pork, and ten pounds of salt beef free of bone, all to be of good quality; but at places where either rice, oatmeal, wheat flour, or peas and beans, cannot be procured, of good quality and on reasonable terms, the quantity of either or any of the other last named articles may be increased and substituted therefor; and in case potatoes cannot be procured on reasonable terms, one pound of either of said articles may be substituted in lieu of five pounds of potatoes; and the captains shall deliver to each passenger at least one-tenth part of the aforesaid provisions weekly, commencing on the day of sailing, and at least three quarts of water daily; and if the passengers shall at any time be put on short allowance during any voyage, the master or owner shall pay to each and every passenger who shall have been put on short allowance, the sum of three dollars for each and every day they may have been put on short allowance; and it shall be the duty of the captain to cause the food and provisions of all the passengers to be well and properly cooked daily, and to be served out and distributed to them at regular and stated hours, by messes, or in such other manner as shall be deemed best. If the captain shall willfully fail to furnish and distribute such provisions, cooked as aforesaid, he shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not more than one thousand dollars, and shall be imprisoned for a term not exceeding one year; *Provided*, That the enforcement of this penalty shall not affect the civil responsibility of the captain or master, and owners, to such passengers as may have suffered from said default.

7. The captain is authorized to maintain good discipline and such habits of cleanliness among passengers, as will tend to the preservation and promotion of health; and to that end he shall cause such regulations as he may adopt for this purpose to be posted up, before sailing, on board such vessel, in a place accessible to such passengers, and shall keep the same so posted up during the voyage; and it is the duty of said captain to cause the apartments occupied by such passengers to be kept at all times in a clean, healthy state, and the owners are required to construct the decks, and all parts of said apartment, so that it can be thoroughly cleansed; and they shall also provide a safe, convenient water-closet for the exclusive use of every one hundred such passengers. And when the weather is such that said passengers cannot be mustered on deck with their bedding, it shall be the duty of the captain to cause the deck occupied by such passengers to be cleansed with chloride of lime, or some other equally efficient disinfecting agent, and also at such other times as said captains may deem necessary.

8. The master and owner of any vessel so employed, which shall not be provided with the house or houses over the passageways, or with ventilators, or with the cabooses or cooking ranges, with the houses over them, shall severally forfeit and pay to the United States the sum of $200 for each and every violation of the provisions, and $50 dollars for each and every neglect or violation of any of the provisions of the seventh section of this chapter.

9. The Collector of the Customs at any port of the United States, at which any vessel so employed shall arrive or depart, shall direct one or more of the Inspectors of the Customs to examine such vessel, and report, in writing, whether the requirements of lawhave been complied with, and, if such report shall state such compliance, and shall be approved by such Collector, it shall be deemed and held as prima facie evidence thereof.

10. The provisions, requisitions, penalties, and liens of this act, are hereby extended and made applicable to all spaces appropriated to the use of steerage passengers, in vessels propelled, in whole or in part, by steam, and navigating between the ports, in this act named, and to such vessels, and to the masters thereof; and so much of the act, entitled "An act to amend an act, entitled 'An act to provide for the better security of the lives of 'passengers on board of vessels propelled, in whole or in part, by steam, and 'for other purposes,'" approved Aug. 30, 1852, as conflicts with this act, is hereby repealed: and the space appropriated to the use of steerage passengers in vessels as above propelled, is hereby subjected to the supervision and inspection of the Collector of the Customs at any port of the United States at which any such vessel shall arrive or depart; and the same shall be examined and reported in the same manner.

11. Vessels bound from any port in the United States to any port in the Pacific Ocean, or from any such port to any port in the United States on the Atlantic, shall be subject to the foregoing provisions regulating the carriage of passengers in merchant vessels, except so much as relates to provisions and water; but the owners and masters of all such vessels shall in all cases furnish to each passenger the daily supply of water therein mentioned; and they shall furnish a sufficient supply of good and wholesome food, properly cooked; and in case they shall fail so to do, or shall provide unwholesome or unsuitable provisions, they shall be subject to the penalty provided in the sixth section of this chapter, in case the passengers are put on short allowance of water or provisions.

12. The captain or master of any vessel arriving in the United States, from any foreign place, at the same time that he delivers a manifest of the cargo, and if there be no cargo, then at the time of making entry of the vessel, shall also deliver to the collector of the district a list or manifest of all the passengers taken on board of the said vessel at any foreign port, in which list or manifest it shall be the duty of the said master to designate, particularly, the age, sex, and occupation of the said passengers, respectively, the part of the vessel occupied by each during the voyage, the country to which they severally belong, and that of which it is their intention to become inhabitants; and shall further set forth whether any, and what number, have died on the voyage; which list or manifest shall be sworn to by the said master in the same manner as directed by law in relation to the manifest of the cargo; and the refusal or neglect of the master to comply with the provisions of this section, shall incur the same penalties, disabilities, and forfeitures, as are provided for a refusal or neglect to report and deliver a manifest of the cargo.

13. Each and every Collector of the Customs, to whom such manifest or list of passengers shall be delivered, shall quarter-yearly return copies thereof to the Secretary of State of the United States, to be laid before Congress

14. In case there shall have occurred on board any vessel any deaths among the passengers, (other than cabin passengers,) the captain or owner, or consignee shall, within twenty-four hours after the time within which the report and list or manifest of passengers is required to be delivered to the Collector of the Customs, pay to the said collector the sum of ten dollars for each and every passenger above the age of eight years who shall have died on the voyage, by natural disease; and the said collector shall pay the money thus received to any board of commission appointed by, and acting under the authority of the State within which the port where such vessel arrived is situated, for the care and protection of sick, indigent or destitute emigrants: *Provided*, That the payment shall in no case be awarded to any board or association formed for the protection of any particular class of emigrants, or of any particular nation or creed; and if the master, captain, owner, or consignee refuse or neglect to pay the Collector sums of money required, within the time, he or they shall severally forfeit and pay the sum of fifty dollars in addition for each and every passenger upon whose death the same has become payable.

15. The amount of the several penalties imposed by the foregoing provisions, regulating the carriage of passengers in merchant vessels, shall be liens on the vessel violating those provisions.

16. Every vessel which shall be employed by the American Colonization Society or the Colonization Society of any State, to transport, and which shall actually transport, from any port of the United States to any colony on the West Coast of Africa, colored emigrants to reside there, shall be subjected to the operation of the foregoing provisions.

17. The Collector of the Customs shall examine such emigrant vessel on its arrival at his port, and ascertain and report to the Secretary of the Treasury, at the time of sailing, the length of the voyage, the ventilation, the number of passengers, their space on board, their food, the native country of the emigrants, the number of deaths, the age and sex of those who died during the voyage, together with his opinion of the cause of the mortality, if any, on board, and, if none, what precautionary measures, arrangements, or habits, are supposed to have had any, and what agency in causing the exemption.

18. This act shall take effect, with respect to vessels sailing from ports in the United States, on the eastern side of the continent, within thirty days from the time of its approval; and, with respect to vessels sailing from ports in the United States, on the western side of the continent, and from ports in Europe, within sixty days of the time of its approval, and with respect to vessels sailing from ports in other parts of the world, within six months from the time of its approval.

19. From and after the time that this act shall take effect, all preceding legislation inconsistent herewith is hereby repealed.

THE

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AND

QUARTERLY REVIEW.

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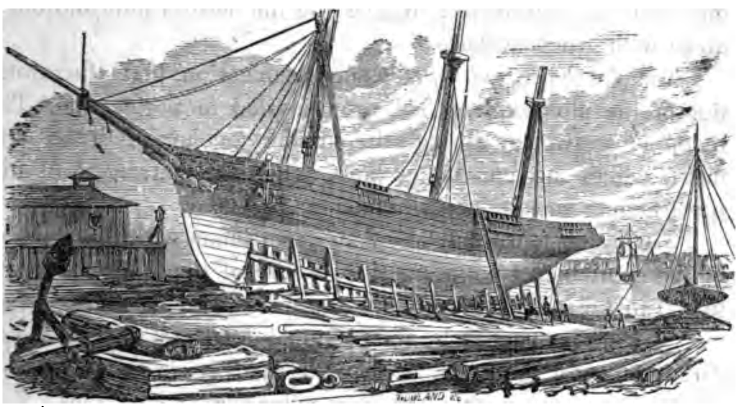
Mechanical Department.



THE TEREDO, OR SALT WATER WORM.

U. S. NAVY-YARD, GOSPORT,
March 20th, 1855.

MESSRS. GRIFFITHS & BATES:

GENTLEMEN:—As the time for the ravages of the "Teredo," or Marine Worm, begins to usher in, it may be interesting to the commercial world to give you a copy of a communication made to the Chief of the Bureau of Yards and Docks, (Commodore Joseph Smith,) and to the Corresponding Secretary of the National Institute, (Jn. C. G. Kennedy, Esq.) You will per-

ceive that I have to get permission, before making any communication separate from direct reports to the Navy Department. This is all right. Our country first. I am at liberty to give you a copy of any of my experiment reports, having, as you know, received authority to do so.

The following letter was written to the Corresponding Secretary of the National Institute, Washington :—

NAVY-YARD, GOSPORT, Va.,
Jan. 8th, 1855.

SIR :—Your letter of the 22d ult. I received on the 25th; and as I have already informed you, hesitated to reply only because I was not perfectly satisfied that I could give the information without permission from the government through Commodore Joseph Smith, Chief of the Bureau of Yards and Docks. Having been fully authorized to give you the desired information, I do so with great pleasure.

I was pleased to see, by your communication, that the attention of the philosophers had been invited to notice the "Teredo," or sea-worm, through the auxiliary agency of the experiments which are conducted here, under the patronage of the government, and my superintendence.*

That my response may show an accordance with the request of the gentlemen composing the Faculty of the National Institute, I make a copy here of the first part of your polite letter, viz.: "I am instructed by the National Institute to return you their thanks for the two specimens of the Teredo, or sea-worm, which you have presented to their collection.

"I have been instructed further to request that you will communicate to the Institute, at your earliest convenience, a paper on the history of this animal, its powers of destruction, and the means of avoiding the same." I now most cheerfully comply with the request of the National Institute, by presenting in this paper a simple history of the *Salt Water Worm,* the "Teredo" of Naturalists, as far as I am acquainted with the insect,

* For which I am not compensated by the government. During the prevalent high prices of food and raiment, the pay in all other departments has been raised.

theoretically and practically. I have read some seven or eight different records of these dangerous and alarming insects. I will, as a preface to my own observations, transcribe from some two or three writers on the subject, and then, unvarnished, relate whatever knowledge of the animal I have obtained practically.

Tredgold says as follows: "The bottom of ships and timbers exposed to the action of the sea are often destroyed by the pipe-worm, or *teredo navalis* of Naturalists. This creature is very small when first excluded from the egg; but soon acquires a considerable size, being often three or four inches in length, and sometimes increases to a foot or more in length. Its head is provided with a hard calcareous substance, which performs the office of an auger, and enables it to penetrate the hardest wood. When a piece of wood, constantly under water, is occupied by these worms, there is no sign of damage to be seen on the surface, nor are the worms visible till the outer part of the wood be broken or cut away. Yet they lie so near the surface as to have an easy communication with the water by a multitude of minute perforations. They were originally brought from India to Europe. Wood is eaten by them till it becomes like a honey-comb. Yet there is an evident care in these creatures never to injure one another's habitation, for the divisions between the worm-holes are entire, though often extremely thin. The fir and alder are the two kinds of wood they seem to destroy with the greatest ease, and in these they grow to the greatest size. In oak they make slow progress, and appear smaller and not so well nourished; they never touch bitter woods, and in solid or hard woods they make slow progress. Charring the surface of wood is not found to be of any use. A mixture of lime, sulphur, and colocynth, with pitch, is found to be a protection to boards, and the like; rubbing the wood with poisonous ointments is a means of destroying them. A mixture of tar, pitch, and the animal hair separated in tanning, was formerly applied, with a sheathing of wood to keep it on; and lately the hair has been felted to apply under copper, or a covering of thin copper, with felting tarred between it and the wood, is the best protection for the bottoms of ships from all marine animals."

A Professor of Natural History in one of the colleges of France, many years past, gives the following description of the animal, thus: "Genus Teredo Mantle, prolonged into a tunnel much longer than two little rhomboidal valves, and terminated by two short tubes, the base of which is furnished on each side with a stony and movable pallette. The Teredo penetrates while young into the wood which it finds submerged, where, by the aid of its valves, it makes itself a residence, enlarging it as it grows in size."

From another Professor of Natural History, I make the following record:

"The Teredines, or ship-worms, are celebrated for the ravages they commit by boring into ships' bottoms, piles of dikes, bridges, &c. These are mollusks, with a very elongated and almost vermiform body, which is enveloped in a tubular mantle open at the anterior and inferior part for the passage of the foot; it is provided posteriorly with two very short, distinct tubes, and its base is furnished on each side with a movable stony plate; the shell is composed of two rhomboidal valves, but is very small, and covers only a very small portion of the matter It seems that the animal, by moving the extremity of its shell like an auger, excavates in submerged wood the hole which serves as its abode. And, as it advances or buries itself deeper, it lines the excavation with a calcareous matter, so that in a short time it finds itself lodged in a stony tube, which at first might be mistaken for a second shell. It begins its attack upon wood when very young, hence the external opening of the gallery is very small, but it digs on until the termination of its growth, and progressively augments the size of its dwelling; the two tubes which occupy the posterior extremity of the mouth always remain near the opening of the gallery, and through one of them it causes the water necessary for respiration and nutrition to enter, for it always remains in its hole mouth down, and the anus above. The *common Teredo,* which is about six inches long, it is said, was brought from the torrid zone, but it is widely-spread in the seas of France, and infects the dikes of Holland to such an extent, that its unprecedented ravages have more than once been near producing terrible inundations; vessels have been

sunk by holes being bored through their bottoms by these animals. To guard against such accidents is one amongst the reasons why ships' bottoms are covered under water by thin sheets of copper."

Refer to the London and Rees' Encyclopedias, and you will get about the same history as quoted above. I therefore close all that others have said, and submit my own *practical* knowledge relative to these terrible enemies to the commercial world.

Whatever information I have obtained of these mischievous insects, I have gained by practical observation. These animals are never known in *fresh water*, therefore they are nowhere seen in our lakes. The most suitable name for them would be, in plain English, the *Salt Water Worm.* I have no other reason for the *name,* than to convey the idea to readers that these destructive animals are not generated *in* wood whilst the wood is in fresh water lakes, rivers or creeks. During the last war with England, the shipping, which was not protected with coppered bottoms in the harbors of Norfolk and Portsmouth, Virginia, were taken up into the James River and other inlets of fresh water, that they might be secure from the ravages of the insect.

In 1849 I received an order from Commodore Joseph Smith, Chief of the Bureau of Yards and Docks, to commence a series of experiments on wood, since which time, I have been actively engaged (when not at my other legitimate duties) in conduct ing the experiments in and on various substances connected with wood.

One course of the experiments I conduot with a view of ascertaining, if possible, the best preparation to hinder the generation of the salt water worm (the Teredo) in wood. I prepare in the spring of the year a large number of blocks of wood, in size generally about twelve inches in length, eight inches in breadth, and about four inches thick,—the thickness being about the medium thickness of the bottom plank of a frigate—the pieces are dressed nicely with smooth surfaces, and deposited in the Elizabeth River, opposite this Navy-Yard, in the month of April. I use all the paints and other substances extant which I have reason to believe will keep the water from *acting on* the

wood. Amongst the pieces thus prepared, I deposit a number of pieces *unprepared*. I also deposit small boxes, made of thin pieces, for the sides and ends—the boxes are also prepared with all the paints known to me. *Parts* of the boxes are unprepared, for the purpose of inviting generation. I commence about the 12th of June to examine the specimens, blocks and boxes. I have never been able to discover any of the animalculæ until about the 20th of June. The examination takes place as follows: the specimens are taken from their localities and wiped clean and dry, clear of fucus and barnacle; after a strict examination, and seeing no orifice, I apply a magnifying-glass, with which I run over the surface—no hole appearing where a minute animal might have *entered*. I take a fine thin shaving off the surface, and then apply the glass again. About the 20th of June, annually, I begin to discover a minute orifice; I cut around the perforation, and see a *very small* white bulb of almost invisible matter. I remove the atom by lifting it on the point of a fine needle, and place the object under the microscope, when I see developed the Teredo, or salt water worm, perfect in all its parts, and capable of *cutting wood* for its subsistence. As soon as the insect is discovered, the *crust* which protects the animal can be also seen formed around its gelatine composition. Daily the animal continues to *grow ahead.* I say grow ahead, because these creatures have no locomotive power. They have neither arms, legs, or fins, by which to move; they grow ahead like a plant, and are really a gelatinous substance; their habitations are *only in wood.* As they grow, they manufacture a crustaceous mantle, which may be called a calcareous crustaceous cell. The animal grows, and the envelope of carbonate of lime increases to suit, for at all times the insect seems to fill the lime-like mantle. During the summer, they grow from six to twelve inches in length, and generally about $\frac{3}{8}$, or $\frac{1}{2}$ an inch at most, in diameter, in this harbor. I continue to place the specimens in the river, until after frost. I have never discovered any sign of the insect in any piece of unprepared wood which generated after the 29th of September. It may be relied on, as to the harbor of Norfolk, Va., and I suppose of the Chesapeake Bay and its tributaries up stream, as far as the water is sufficiently

salt, that the salt water worm does not have its being before the 20th of June of each year, and that the animals do not *enter*, nor are they generated after the 30th of September of each year. The insect being generated before the 30th September, will continue to do damage until the cold destroys them, or the wood is broken, and they die and waste away in the alcoves.

I digress to observe that I cannot account for the wood that is destroyed in cutting the tunnel. Many of the insects excavate a tunnel, twelve inches in length and half an inch in diameter; the perforation, if the worm does in reality *enter*, is invisible to the naked eye. Split one of the specimens open, and the worm, enveloped in its lime-like substance, fills the orifice. May I ask the philosophic world, what has become of the wood? Could it escape through an invisible perforation?

In the harbor of New-York, I suppose, the generation commences sometime about the 1st of July. I am not sure, but I believe the Teredo will generate the whole year in the waters as far south as Charleston, S. C., as well as in all very warm climates, in the West and East Indies in particular, coast of Africa, &c. In the harbor of Boston, New-Hampshire, and Portsmouth, where the government has Navy Yards, the worm does but little injury. Piles driven for any of the bridges crossing from Boston to Charlestown, or crossing the river from Portsmouth to Kittery, Maine, will not be injured in a number of years. The worm in these harbors is small in appearance, like the vermicelli threads used in soups. The damage done to piles in those harbors are at *high* and *low* water mark. There seems to be a pause when the tide is done running *up* or *down*; at that time only can these animals begin to generate, and at those two points only (high and low water) are these insects mischievous in those harbors. It is said these animals are not as destructive near the New-York City side, either on the North or East River, as they are on the Brooklyn side, or the Jersey side of the harbor. I have seen wood seriously injured on the Long Island, Brooklyn, side, and have been well informed that the piles driven at the different ferries on the New-York City side (North and Eas are but little damaged, compared to the injury done in the bay, betwixt the Navy-Yard, at Brooklyn, and the City of Williams-

burg, Long Island. One thing is certain, all vessels employed in the New-York trade should be protected from these enemies to commerce. I suppose the cause of the worm not generating near the wharves of the city in great numbers, is the immense quantity of filth which must run off into the river, which effluvia may act as a poison to the insect.

(To be continued.)

THE FIRST SLIP MODEL AND ITS INVENTOR.

The universal use of the slip or water-line model in the United States, and the increasing favor which it finds at the hands of ship-builders in all countries where its utility has been tested, renders it an interesting question, when, where, and who made the *first* model of this description? For the sake of placing upon the record whatever information may be in our possession respecting the origin of this simple and most useful invention for obtaining the bodies of vessels in rotundity, we give place to the following letters from a New-York ship-owner, whose interest in maritime subjects is only equalled by his enterprise and success in their prosecution. It will be seen that Mr. Griffiths had been making inquiries concerning the inventor of the slip or water-line model, at Salem and Newburyport, when he was writing his "Treatise" upon "Marine and Naval Architecture" in 1850, and to which the following letter refers:—

New-York, April 29, 1851.

J. W. Griffiths, Esq.,

Sir,—I have just returned from Newburyport. Mr. James L. Townsend told me you had last winter been there, endeavoring to find out who was the first person that built ships or vessels from slip models. During my late visit, to examine a ship Mr. Townsend is building for me, an old gentleman, 88 years of age, an old ship-builder, came to Mr. Townsend's ship-yard—he built the Alliance frigate during the Revolutionary War, and the Wasp during last war—he invited Mr. Townsend and myself to visit him at his house. We went accordingly, and he placed in my hands a slip model made by him during the years 1794, 1795, or 1796—the exact year he could not remember. His name is Orlando B. Merrill, and was born in the year 1763. It was from Mr. Merrill that Mr. Dutton got his ideas about models. I understand that the late Isaac Webb, and Mr. Stephen Smith,

(Smith & Dimon) both claim the merit. It is evident that Mr. Merrill had used the slip model when these gentlemen were mere boys. I told Mr. Townsend I would communicate these facts to you on my return to New-York.

Yours tru DAVID OGDEN, 97 Wall-street.

The following letter shows that Mr. Ogden subsequently procured the above-mentioned model, which is still at his office in this city :—

NEW-YORK, July 28, 1851.

J. W. GRIFFITH, Esq.,

Dear Sir,—I have now at my office, 97 Wall-street, the original slip model I spoke of sometime ago. It was made by Orlando B. Merrill, in 1794, and I presume that it was the first made in this country. Mr. M. is now alive, and is 88 years of age.

Yours truly, D. OGDEN.

Mr. Merrill died in 1854, at an advanced age. We intend to publish the draught of the model now in the possession of Mr. Ogden, with his permission, to illustrate American ideas of modelling 61 years ago, upon the shores of New-England.

NAVAL QUESTIONS ANSWERED.

TO THE EDITORS OF THE NAUTICAL MAGAZINE :—

GENTLEMEN :—Much has been said by the press and the people, of the necessity of reorganization in the Navy, of its inefficiency, both in the number and quality of ships, and of their management. But why (if it is not presuming too much to inquire of you) are not the ships of the Navy the best models that could be devised? Are not our Naval Constructors the best and most experienced men, selected from among the ranks of private builders, who build the finest ships in the world?

Respectfully yours, YOUNG AMERICA.

We will answer the interrogatories of our Young American correspondent briefly, for want of space in the present number. First, we say, that our Naval Constructors are not selected from the ranks of private builders. Second, we say, that the present rate of compensation is not sufficient to command the exclusive use of first class talent from among the private shipbuilders of the United States.—[EDS.

TABLES OF THE SCHOONER CHALLENGE.

In giving the mould-loft tables of this vessel, it may not be improper to make a few remarks, even though the writer and the builder should be found in the same individual. We are not of those who hold, that silence is always to be observed when testimony shall be required upon the various subjects of our personal experience, of sufficient interest to deserve a place on the page of journalism. We have reason to know, that the vessel above named, although a schooner of 110 tons, engaged in the internal coasting trade of the Lakes, has excited no small degree of interest, wherever known; and it may gratify not a few to be placed in possession of her secrets. In giving these to the public, we do no more than we wish to have done by every other builder in America, who is willing to give and receive the facts of experience, in the line of his vocation, not less of right than privilege. This magazine was established for the advantage of all; and in our new capacity of journalists, we shall be quite as well pleased to set forth the results of our correspondents' genius in ship-building as to model and build vessels in the exercise of our own.

The schooner Challenge was built at Manitowoc, Wisconsin, and launched in April, 1852. Her owners, Platt & Brother, enterprising merchants of that place, confided the entire design, model, and construction, to the writer, with the intuitive assurance, that in all these respects a competent builder can derive no assistance from those who can make no pretensions to a *practical* knowledge of Marine Architecture. And although the model which was adopted was entirely different from that of the vessels of those inland waters, and in this respect, therefore, to be regarded as nothing better than an experiment, yet such was the intelligence of her owners, this vessel was permitted to go from the hand of her builder free from deformities of *alterations*, and we might say, consequently, fairly on a footing to test her merits. It is too often the case, that experiments in models, as in many other things, are saddled with the follies of avarice, fear, or prejudice, and thus encumbered with insuperable burthens, till quite broken down under the ignoble load. This was not the case in the present instance; and the writer

cherishes with grateful recollection the remembrance of the fact.

The peculiarities of the Challenge arose from the study of a "Treatise on Marine and Naval Architecture," by John W. Griffiths, of New-York, published during the year 1850. The principles laid down in this admirable work the writer endeavored to embody in her model, in combination with such views of adaptation to the trade designed for, as seemed to be approved by his own judgment. We think it proper to state these facts, because the influence of an author's writings, although capable of being legibly traced in all subsequent monuments of mechanical art, is seldom acknowledged by architects as it ought to be. And it is no less true, that the production of every successful model makes a mark upon ship-building, which endures long after the fragments of the lucky vessel have been scattered upon the strand or sea. Until the appearance of Mr. Griffith's work, the writer, like many other builders in the United States, drew upon the so-called researches of theorists in Europe for the *science* of his profession.

The Challenge, we are quite sure, was the first vessel on the Lakes which was avowedly modelled upon the new American principle. She was designed for a vessel of light draught, a good carrier, and a fleet, windwardly sailer, and for these qualities she is generally acknowledged to have no superior, of her size, on the Lakes, where there are vessels that will lose nothing by comparison with those in any part of the world, for any quality whatever.

The following are her dimensions:—

Length on load line,	80 feet.
Moulded breadth,	21.10 inches.
Breadth extreme,	22.4 "
Depth of Hold,	6.5 "
Displacement,	5800 cubic feet.
Custom-House Tonnage,	110 tons.

Cargo, from 65,000 to 70,000 superficial feet of pine lumber.
Deep load draught of water, 5 feet 8 inches.

Performance.—When lumber loaded, and in smooth water, all sail set, by the wind, and lying between four and five points, she runs *nine* miles an hour. In a gale of wind, in ballast trim, she has run a distance of 25 miles at the rate of 15 miles an hour.

MOULD-LOFT TABLES OF SCHOONER "CHALLENGE."

	Rise of margin line above base line.	Half breadths of keel.	Height of gun-wale above base line.	Height of rail above base line.	Half breadth of 1st WL.	Half breadth of 2d WL.	Half breadth of 3d WL.	Half breadth of 4th WL.	Half breadth of 5th WL.	Half breadth of 6th WL.	Half breadth of 7th WL.	Half breadth of rail.
	in. 8ths.	in. 8ths.	ft. in. 8ths.	ft. in. 8ths.	ft. in. 8ths.	ft. in. 8ths.	ft. in. 8ths.	ft. in. 8ths.	ft. in. 8ths.	ft. in. 8ths.	ft. in. 8ths.	ft. in. 8ths.
b			9 4 7	11 8 2			0 6	0 10 5	1 4 7	2 1 1	3 0 3	5 7 0
Z	7 6	4	8 11 7	11 3 3	0 5 6	11 4	1 6 7	2 3 3	3 2 0	4 1 6	5 2 2	7 1 5
X	2 7*	4 2*	8 7 4	10 8 3	1 0 0	1 11 3	2 11 3	3 11 7	5 0 6	0 6	6 11 3	8 2 6
V	1 7	4 5	8 3 5	10 7 2	1 7 4	3 0 6	4 5 3	5 7 5	6 8 3	7 6 3	8 2 2	8 11 5
T	1 2*	5	8 0*	10 3 7	2 4 5	4 3 4	5 10 3	7 0 1	7 11 7	8 7 3	9 0 7	9 6 0
R	7	5 3	7 9 –	10 0 7	3 2 1	5 6 3	7 1 6	8 2 5	8 11 3	9 4 5	9 7 7	9 10 6
N	2*	6 3*	7 4 2	9 8 1	5 1 4	7 8 1	9 0 3	9 8 2	10 0 7	10 3 2	10 4 2	10 4 5
I		7 5			7 0 3	9 0 3	9 11 6	10 4 7	10 7 4	10 8 1	10 8 1	
E		8 0			8 2 7	9 8 5	10 5 4	10 8 7	10 10 3	10 10 2	10 9 3	
Dead flat		8 0	6 8 0	9 2 0	8 7 0	9 10 7	10 6 6	10 9 7	10 10 7	10 10 5	10 9 5	
1		8 0	6 7 6	9 1 6	8 8 1	9 11 3	10 6 5	10 9 4	10 10 4	10 9 6	10 8 3	
5		8 0	6 8 3	9 2 5	8 2 1	9 7 3	10 3 5	10 6 6	10 8 0	10 7 2	10 6 0	
9	2	7 6	6 10 6	9 4 1	7 0 7	9 0 1	9 10 5	10 2 2	10 4 0	10 3 5	10 2 3	10 2 6
13	3*	[illegible] 2	7 1 7	9 6 6	5 0 5	7 9 4	9 1 4	9 8 4	9 11 0	9 11 0	9 10 0	9 9 2
17	5*	4 6*	7 5 6	9 9 6	2 10 3	5 7 0	7 8 6	8 10 3	9 4 2	9 5 3	9 4 4	9 3 3
21	7	4 1*	7 9 3	10 1 2	1 3 0	2 5 0	4 3 0	7 0 7	8 5 6	8 9 7	8 10 [illegible]	8 9 1
23			7 11 5	10 3 2	8 0	1 1 4	2 11 2	4 0 1	7 8 3	8 5 5	8 6 3	8 5 4
24							1 0 6	2 1 0	6 9 2			
25			8 2 0	10 5 2					3 0 4	8 0 0	8 2 5	
Stern	—	—	—	—	—	—	—	—	—	7 6 6		
27			8 4 2	10 7 2							7 10 5	8 1 5

Water lines apart, 15 inches; timbering room, 18 inches; angle of dead rise, 3 degrees; dead flat, floor straight, 4 feet out from side line.

		ft. in. 8ths.
Rake of margin line of stem from frame Z, on	1st WL.	1 3 4
" " "	2d "	2 10 6
" " "	3d "	3 10 3
" " "	4th "	4 7 0
" " "	5th "	5 3 6
" " "	6th "	6 0 3
" " "	7th "	6 9 4
" on water line 2 feet above	7th "	8 3 0

Point of intersection with rail, 11 in. forward of frame f, and 1 foot 9¾ in. above water line referred to, 2 feet above 7th. Round aft on the 7th WL., on the stern is 5 inches in 7 feet 9 inches.

	ft. in. 8ths.
Rake of stern aft of frame.......24	
" on base	1 0 0
" on 4th W. line	2 0 0
" on 5th "	2 4 2
" on 6th "	4 1 4
" on 7th "	5 6 0

A straight line drawn through the las ttwo spots will give the middle line of stern.

The keel is moulded 7 inches; the floors being boxed in one inch, and the plank being two inches thick, leaves four inches outstanding keel. Sternpost, at the keel, is sided 8 inches; at the 5th water line, 13½ inches; stern is sided 8 inches at the keel, and tapered 15 inches at the gunwale; the fore edge is bearded to 3½ inches, with the lines of the bow. The frame is of white oak flitch-timber, four inches thick, (part of it a little thicker); at dead-flat it is moulded 8 inches at the keel, 4½ inches at the gunwale, and 4 inches at the rail, diminishing between those points with a straight taper line.

The frames are canted around the bow-spaced 7 inches apart on the deadwood, and 16 inches at the gunwale, being made in one stick of flitch-timber, sided 5 inches. Every alternate frame has a stanchion, sided 5 inches, forming the extremity of the frame. The round of deck is 7 inches at mid-length. The centre board is 20 feet long, and the box is 21½ feet long. Both the board and the box, or the trunk, are made of 4 inch white oak plank. The board drops through the middle of the keel. The mainmast stands close up to the aft end of the centre box, and the forward end is kneed to the keelson with a 7 inch knee. The keelson is sided 12 inches at the ends of the centre box, and 8 inches at the extremities, and is moulded 12 inches, being scored two inches over the throats of the frames, and fastened through every frame with $\frac{7}{8}$ inch bolts, riveted below the keel. There are four strakes of wales, three inches thick, 5⅛ inches wide at midships, and tapered to 3⅞ inches at wood-ends.

The bottom plank are two inches thick, white oak, square-fastened with 5 inch spikes, and the wales are squared off below to form a flush side. There is one strake of clamps, 12 inches wide, 3 inches thick, square-fastened with 7 and 8 inch spikes; one thick bilge strake, 5 inches thick, 10 inches wide, and 30 feet long, boxed 1½ inches over the frames. The ceiling is two inches thick. The beams (there are no carlings) are placed from 2 feet 9 inches to 3 feet 3 inches apart, as required, and are sided 7 inches, moulded 6½ inches at centre, and 5 inches at the ends—all white oak. They are single kneed. The deck plank is 2½ inches thick, of white pine, kiln-dried. The strakes

are 5$\frac{3}{4}$ inches wide at midships, tapering to the extremities, in proportion to the taper of the breadth of the vessel. The plank sheer, which is worked down upon the beams, there being no water-way, is 14 inches wide and 3 inches thick, of white oak, also tapering with the vessel. The rail is 8$\frac{1}{4}$ inches wide and 3 inches thick. The rudder stock is 9$\frac{1}{2}$ inches diameter. The windlass body is 6 feet long and 16 inches diameter, worked by patent gear; windlass ends are 22 inches long, and 13 inches diameter. The bow is finished without a cutwater.

The dead-flat frame is located *three feet abaft the mid-length of load line*, and the bow is, consequently, the longest and sharpest end, with hollow water lines, and very easy section lines. The lifting power of the bow is large.

Spars and Sails.—The foremast is located 18$\frac{1}{2}$ feet abaft of margin, on load line, or fourth water line, raking $\frac{7}{8}$ inch to the foot; the mainmast is placed 7 inches abaft frame No. 7, on load line, rake $\frac{7}{8}$ inch to the foot. Centre of effort of sail, is immediately over frame B, or the centre of length of load line, and 30 feet 5 inches above the latter. It is also 19 inches forward of the centre of *buoyancy*, or centre of gravity of displacement, and about 2 feet forward of the centre of lateral resistance, unless the centre-board is well down, in which case it is less. The area of four lower sails, viz.: mainsail, foresail, jib, and flying-jib, is equal to 4,303 square feet of canvas. She carries in addition a main-gaff topsail, and main-topmast staysail; but has no fore-topmast. Hoist of foresail, 47 feet; of mainsail, 46 feet. Main-boom, 44 feet; fore-boom, 33 feet; gaffs, 29 feet each; bowsprit, 16 feet to the stay, outboard diameter 17 inches, at cap 11 inches; jibboom, 35 feet out from knightheads, diameter 9 inches, of white ash. Mainmast, from load-line to trestle-trees, 60 feet 9 inches; mast-head, 10 feet 3 inches; diameter at partners, 18$\frac{1}{2}$ inches; topmast, 42 feet long; foremast, from load-line to trestle-trees, 62 feet long; mast-head, 8 feet; diameter at partners, 18 inches.

Draught of water when launched, the hull being finished and having no spars, but with the rigging, blocks, &c., on board, was 2 feet 4$\frac{1}{2}$ inches above base line, or 2 feet 8$\frac{1}{2}$ inches including keel, and trimmed on an "even keel." When rigged and ready

for cargo, she drew 2 feet 8 inches forward, and 2 feet 6 inches aft, above base line, (of model), or 6 inches more with the keel included. Her trim is upon "even keel," or an inch or more by the stern when loaded.

Her total cost, when ready for sea, amounted to $4,450. Two years running repaid her first cost, with interest, when she was sold for $5,000.

THE STANDARD OF TIMBER INSPECTION AT THE U. S. NAVY YARDS.

THE following extract from "Proposals for Timber," issued by the NAVY DEPARTMENT, Bureau of Construction, &c., will exhibit the standard of inspection for plank stocks, to be received on contract at the different Navy Yards of the country.

It will be seen that white oak and yellow pine are the kinds of wood which stand at the head of the list for this description of ship building material:—

"The white oak plank stocks to have grown within sixty miles of the salt water, of which satisfactory evidence must be given to the commandant of the yard where it is delivered. One-half the number of logs must be 43 feet in length; none of the remaining half to be less than 35 feet in length; and the whole quantity to average 43 feet. The small end of one half to be not under 12 inches square, clear of wane, and the remainder not less than 14 inches. To be lined tapering, in conformity to the growth of the tree, straight, or with a long fair curve; no sudden crooks will be allowed; no wane exceeding one-fourth of the width of the stick, as squared; the sap wood to be excluded in the measurement.

The yellow pine plank stock must average 45 feet in length, and no piece be less than 38 feet; to be lined with the natural taper of the tree; but no sudden crook must be allowed. The small ends not to be less than 4-5 of the butt; the small ends of one half to be not less than 12 inches square, clear of wane, and the remainder not less than 14 inches; the sap wood not to exceed ⅛ of the face from each corner, and to be excluded in the measurement. In both the oak and pine, reductions will be made for axe-marks and imperfect squaring. The whole to be of the best quality of white oak, and long leaf, fine grain yellow pine, and free from defects."

WHAT THE UNITED STATES NAVY WOULD BE IF ADAPTED TO THE AGE.

The man of observation, who calmly surveys the map of North America—washed by the turbulent billows of the Atlantic Ocean, separating it from Europe on the East; semi-sea-girt by the more tranquil waters of the Pacific Ocean, dividing it from Asia on the West; bounded by the Arctic Ocean and Baffin's Bay on the North, and washed on its southern border by the Gulf of Mexico and the Caribbean Sea—will hardly fail to discover that the sceptre of Commerce lies within this wide and well-watered domain, and that its unfolding history must inevitably be shackled to the maritime interests of futurity. Whether it shall be governed by Americans or Europeans—whether the form of government shall be monarchical or constitutional, republican or democratic, its inhabitants, if true to themselves, will hold the key to the treasures of the world. The vast extent of its inland seas and navigable rivers, with its diversified climate, soil and productions, find a counterpart in the peculiarly characteristic soundings around its sea-girt coast. Its bold, iron-bound acclivities on the north, its bedimmed approaches on the east, with its sand keys and shoals on the south, no less than the limited depth of its harbor entrances on the west, furnish the index of its commercial wants. Endowed, at present, with a form of government possessing the elements of endurance and numerical strength, the United States furnishes a chart in her history upon which the misguided and misgoverned of every land may look with interest; and as they gaze upon the broad banners of freedom, welcome its stripes as the scourge of despotism and the hope of liberty in every clime. While, by the peaceful pursuits of husbandry, millions of acres of the virgin soil are being added to the vast domain of her intrinsic wealth, causing the waving grain or the flexile staple to furnish bread to feed and the wherewithal to clothe, the trackless courser, at the bidding of its master, flies before the gale, or hurls defiance at the tempest, by the omnific power of science and art, until the maritime supremacy of the United States is no longer a problem. The ancient commerce of the old world found its

adaptation in the galley; and, in less antiquated times, the galliott, the polacca, or the polaire, have served the purposes both of war and commerce. The plundering propensities of barbarian ages furnished the index to the kind of vessels required to conquer the ravaging foe. It was then that the genius of governments were taxed to overpower the piratical marauder. As a consequence, the government was regarded as the exponent of all worth possessing in every department of nautical mechanism. But that age has passed—the day has gone by when the naval prowess of that traditionary age shall be looked upon as the indicator of commercial want. The history of Spain and France, within the last centuries, has been a living commentary on the influence of hereditary or traditional knowledge; and may we not add England to the list—she who boasted the finest navy in the world? Look at her humiliating position in the Baltic. In the language of one of her statesmen, in speaking of Admiral Napier, "he saw the enemy, but could not reach them, he could do nothing but gather experience; there was too much depth of ship below water throughout the entire fleet, and his communication to the nation was clear and emphatic, *that if it would take Cronstadt it must build another fleet.*"

May we not here inquire whether the larger vessels of the United States Navy are any *better* adapted for such service as that of taking Cronstadt than those of England? We pause for a reply. Echo answers, No! Then let us profit by their experience. How is it with the new steam frigates? Are they of the same stamp with reference to draught of water? Let us not deceive ourselves in assuming, that, in order to have an efficient Navy, we must have ships of the line with a heavy draught of water, which inevitably follows. We might learn a lesson in the school of experience upon the management as well as on the construction of our Navy. Let us reflect while we listen to Lord John Russell. In speaking of the distress in the Army and the Navy, he says: "We have left them to the care of *tradition*, and that *irresponsible old monster* has led them to famine and disease in the Crimea, and to *ridicule* in the *Baltic.*" And again, in speaking of the Navy, he says: "That glorious service is cumbered with *officialism* and *dreary incapacity;* it is

directed by *age*, instead of *maturity* and *genius: tradition strangles merit* in the Navy, and until the hoary thing is driven away from the service, the flower of the country will be sacrificed, because time hallowed *custom*, and immemorial *usage*—most abused of all sentences—*prefers Admirals tottering* on the *verge of eternity*, to men in the *prime of life*, reared in the new school, and familiar with the *science* and *circumstances* of the *age*." If we use this mirror of the imbecility and inefficiency of the English Navy, shall we not see the picture of that of the United States in very many if not in most respects. And yet, we have men in the Navy and out of the Navy, in Congress and out of Congress, denouncing the construction of sloops of war, only because they do not wear that formidable appearance which has the empty title of wooden walls, which the English Navy have borne since the defeat of the Spanish Armada, and which now, in the day of trial, is her greatest foe. How many would-be Admirals in the United States Navy would gladly see our government engaged in the construction of a fleet of three-deckers not unlike the Pennsylvania, which, as we have shown years ago, is a total failure—moored in one place to be looked at, and used as a receiving ship until she grounds on the *bar* of beef bones thrown overboard! How mortifying must it be to the English nation to be compelled to build two fleets to get one! And, indeed, so completely is the *traditionary* principle incorporated with the English manner of doing things in the government service, that it would not be at all surprising to us, if they were not compelled to build a part of the third before they obtain the first, inasmuch as we see the draught of water of one of their new vessels set down at twenty feet—more than double what it should be. But what right have the people of the United States to expect improvement in the Navy while in the hands of the *traditionists*, who, in the hour of need, would be (as Lord John Russell farther remarks, in relation to the *Admiralty*,) puzzled; having no *inventive faculty* within their own body, they disdained to call in any assistance that was tendered them by the eminent ship-builders of the country; and had not some ingenious Frenchman suggested the floating battery, most likely the Baltic fleet would again have been sent out to gather expe-

rience, and the British lion again would have been led to chafe at the barrier it could not overleap. It is a truism with which a child may be made familiar, that a vessel of light draught of water *can* go into deep water, and it is equally true that a vessel of heavy draught *cannot* go into shoal water. Is there any man silly enough to believe that an enemy will be so accommodating as to remove a bar or shoal at the mouth of one of their harbors for the benefit of a hostile force? And yet we might be led to think so, when we read the arguments presented in Congress, and by Naval Officers themselves, in favor of these *wooden walls*. Hence, we say, let the United States Navy be adapted to navigating our own coast—to entering all our own ports of entry—and then it will be adapted to the ports of an enemy, whatever nation it be. And still farther we say—and we write understandingly upon this subject—let it be remembered, as we shall prove when called upon, that no war vessel should draw over seventeen feet water; and this draught may be secured on any vessel of the largest capacity yet built, and with the highest rate of speed, either by sailing or steaming vessels, screw or side-wheel.

(*To be continued.*)

QUEBEC, 3d Feb. 1855.

MESSRS. GRIFFITHS & BATES, NEW-YORK:—

GENTLEMEN:—I have subscribed to your valuable Magazine through your agent here, Mr. Sinclair. In your November number, giving the list of vessels built at this port for 1853, you put down the "Shooting Star" "Arthur the Great," and "East City," as being built by Charles Tobin, when, in fact, they were all built by me, under the superintendence of W. Power, my foreman, formerly of your city. Please rectify this in your early number, and oblige THOMAS C. LEE.

A PAINT FOR SHIPS' BOTTOMS.—A Bristol (Eng.) Company takes out a patent in England for the following:—White or red lead is combined (without lead) with black lead and sugar-of-lead, with gum copal dissolved in spirits of turpentine. The proportions preferred are—one part of white lead, one part of red lead, one part of black lead, and one-quarter part of the sugar-of-lead—all by measure. These matters are ground with spirits of turpentine, and when for use, gum copal dissolved in turpentine (white copal varnish) is added. The composition is applied as a paint. If the red color is objected to, the red lead may be omitted, and in second and subsequent coatings the sugar-of-lead may be omitted also.

THE FORBES'S RIG FOR SHIPS.—NO. II.

The experience of this "New Rig," for the last ten years, has not failed to satisfy all who have tried it, either in the capacity of shipowner or master, that either it or some analogous rig, which might be founded upon the same principles, must come into general use in the merchant service; and if so, may we not fairly expect that its improved characteristics will be equally appreciated by the Navy of the United States. Its early introduction and general satisfaction on board of the U. S. steamer "Massachusetts," should have been an ample guarantee of its utility for war vessels. In keeping this improvement before the commercial men of this country, Capt. Forbes has invariably endeavored to ascertain from the commanders of ships, in which he had an interest, whether any objections in practice had been found to this new rig; and he is able to assure us that no essential alterations, which deserve to be termed improvements, have been suggested; and that all those within the scope of his knowledge, who commenced voyages with prejudices, have returned fully convinced that the new rig is better and cheaper, *in the long run*, than the old. It is true, there have been a few instances where modifications of this rig have been made, which, so far from adding to the utility or beauty of the rig, have sadly detracted from both.

The reader will be highly gratified with the perusal of the following opinion of Capt. Louis M. Goldsborough, Commander U. S. Navy:—

"Portsmouth, N. H., *July 25th*, 1854.

"R. B. Forbes, Esq.:

"My Dear Sir:—Within the last three years it has been my lot to pass some fifteen months on board the 'Massachusetts,' which ship, it is quite generally known, was not only built under your own supervision, but also rigged throughout after your own original design, now recognized as 'Forbes's New Rig.'

"Our public duties in that vessel involved a protracted sea-service, in the course of which ample opportunity was afforded me of witnessing the effects of her peculiar rig, under a variety of circumstances, and of forming my own conclusions as to its real merits. These, in my judgment, are very decided, and carry with them advantages affecting economy, safety, and convenience, which cannot be too strongly impressed upon the minds

of ship-owners, and all others in any way concerned in commerce or navigation. Among the advantages which the 'new rig' possesses over the old, the following may be enumerated:

"The ordinary number of men allotted as the crew may be reduced, without compromitting either efficiency or safety.

"Spars are less liable to be carried away, and sails to be worn out in calms, or split or lost in heavy weather, owing to the great facility of management which the rig itself especially confers.

"A more general interchange of spars and sails, fore and aft the ship, than is effected by any other mode of rig.

"Much flatter surfaces of sails, and hence a material benefit in bowline sailing.

"Less *leverage weight* aloft, (regarding the point of support to lie in the plane of flotation,) and thus a less tendency to interfere with stability, or to cause the ship to incline. The eye itself may induce an opposite impression; but if one will take into consideration the materially reduced size of topmasts, actual position of yards when all the canvas is spread, quality of canvas, distribution of heavy blocks, &c., &c., the error of such impression will soon be made manifest. This, too, may be easily confirmed by quite an elementary calculation.

"In the emergency of reefing down, even to double-reef topsails, when the ship is in a *tight* place, the advantages of this rig are very conspicuous, for it may be done *without losing the command or steerage-way of the ship in the slightest degree*, and with the greatest facility. In the event of a squall, too, all that is necessary to bring the vessel, as it were, under double-reef topsails, is simply to let go the top-allant halyards; for then, the topgallant sheets being kept fast, the sails, assimilating as they do to those of a polacre, will take very good care of themselves, provided only that braces and buntlines be looked after.

"Its applicability to sea-propellers is another point worthy of especial notice. In such vessels, striking topmasts and sending down all the yards fore and aft must be of frequent occurrence. The topmasts being abaft, of comparatively light weight, and not interfered with by the lower yards, the performance of the task is thereby very much facilitated.

"Also for men-of-war of a large class—line-of-battle ships—manifold reasons may be assigned why it should be preferred.

"While on the coast of California we had occasion to go from San Francisco to the Sandwich Islands. This was done with but a boat's crew of men to handle the ship; and when about mid-way, the number of these men was reduced, by sickness, to four in a watch. Notwithstanding this circumstance, no one on board felt the slightest apprehension as to the safety of the ship, nor was canvas spared her for a moment on that account. Had she been of the old rig, we should have felt our situation very differently.

"In conclusion, I beg to assure you that so far as I ever exchanged opinions with the officers of the 'Massachusetts' in relation to her rig, every one of them was literally delighted with its convenience and efficiency. Indeed, I have not yet met the first person, whether in or out of the navy, who has actually served in a vessel rigged after your fashion, at all disposed to dispute its advantages, or to do otherwise than commend them in the warmest terms.

"Very sincerely and truly yours,

"L. M. GOLDSBOROUGH,

"*Commander U. S. Navy.*"

The "Massachusetts" is an auxiliary screw-ship of the United States Navy, and her officers are abundantly qualified to testify respecting the merits of any improvement in the rig for this peculiar class of vessels; and we regard the opinion of Captain Goldsborough as conclusive in its favor, as a naval authority. With the other improvements which are to be adopted in the construction and equipment of the six screw frigates now building in the navy-yards of this country, it will be but fair to expect that they are to be fitted with the "Forbes's Rig." We are not informed of the fact, however; yet we cannot for a moment suppose that the advantages of this rig are to be overlooked, especially in view of the fact that, before the details of these ships were laid down, our government sent a commission of naval gentlemen abroad to Europe, in order to become posted up upon the mysteries of propeller-building. It cannot, therefore, be possible that an improvement of such vital importance, as shown by Capt. Goldsborough, originating in our own country, will be overlooked. Yet we are not positive, as mistakes have happened as great as this would be.

There can be no better reason assigned why the new rig has not been already very generally adopted than simply this—*that it is new;* that *nothing* is asked by the inventor by way of an *appreciative fee* for its use; that ship-owners, not seamen, are unwilling to adopt anything which appears to them to be an experiment, or which adds anything to their labor and to the *first cost* of their ships, however economical it may be in the long run. It is *the pennies of the present* that blocks the wheels of many an improvement that waits a whole generation for an introduction, often at an immense cost on every hand.

Again; ship-builders, spar-makers, riggers, and blacksmiths, are indisposed to recommend anything out of the ordinary course. Improvements like this are no concern of theirs; and owners have hitherto failed to find in the press, to which they look as oracles in other matters, any medium of intelligence upon such dark and misty subjects as maritime economy. A brighter day has dawned; the commercial men of this country may now address themselves to a legitimate source for information upon nautical subjects—we refer to this periodical.

The "Forbes's Rig" is no longer an experiment. It has been tried by the best ships sailing from ports in the United States. Many new ships are adopting it; and more than ever before, in any one year, have been fitted with it during 1854.

The splendid lithograph which accompanies this article, and for which we are indebted to the munificence of her owner, this excellent rig is exhibited as applied to the Liverpool packet-ship "AURORA," commanded by Captain Bunting, and owned by Cornelius Grinnell, Esq., in whose splendid packet-line she took her place at the commencement of the present year, from the hands of William H. Webb, ship-builder, of New-York. This beautiful ship has no superior in her trade; and, not only in rig but in model, is one of the finest working vessels afloat, of her dimensions.

We think that even if the great principle of utility should be laid aside, the rig of this ship would not suffer from any fair criticism upon the point of beauty; and when these qualities are thus found combined, what more can be desired?

The only difference which Captain Bunting has thought to make between the rig of the "Aurora" and that designed by Captain Forbes, consists in this: the yards on the foremast correspond exactly with the dimensions of those on the main—the only difference between the fore and main spars being, as will be seen, in the length of the foremast. The sails on either the fore or main masts, will convert at the same stage of elevation; and the sails of the mizen will, consequently, convert on either the main or fore masts alike, two stages higher up. Capt. Bunting's reasons for adopting the fore and main yards of the same length are these: to secure a full press of wind on the fore

sails, and avoid the liability of having them experience the becalming effects of those spread on the yards of the mainmast, when going before, or with the wind on the quarter. In all other respects Capt. Bunting has adhered to the original rig. In the case of the "Aurora," the topmasts are fidded before the mast heads.

The following letter from Captain Bunting, with remarks by R. B. Forbes, Esq., published in the *Boston Atlas*, newspaper, will be read with interest by nautical and commercial men :—

"BOSTON, *Jan.* 15.

"DEAR SIR :—Below is a note from Mr. Grinnell, the owner of the 'Aurora,' which ship has my rig, with the masts fidded before the mast heads. The 'Cornelius Grinnell' has the same rig, with the masts fidded abaft. Nothing can be stronger than the recommendations of Captain Fletcher of the latter ship. There are many good reasons for fidding abaft in square-rigged vessels; among which, I may mention that when the topgallant masts are housed, the upper topsails can be set as well as when the masts are up, and when the topmasts are housed, the lower topsails can be set as well as when the masts are aloft. There are many ports, known to our trade, where housing topmasts and still preserving the ability to get under weigh with sail equal to courses, and double or close-reefed topsails, would save the ship. I would cite Madras, the coast of China, Cape of Good Hope, Mauritius, Valparaiso, Gibraltar, the Downs, and other roadsteads on the coast of England and France—Vera Cruz, Monte Video, and other exposed places, too numerous to mention.

"If all the transports and men-of-war lost off Balaklava had been rigged with my rig, as originally fitted in the 'Massachusetts,' with screw fids, I think it probable that many of them would have been saved; especially, if the gale gave sufficient warning by the fall of the mercury in the barometer.

"The reason that topgallant masts and topmasts are not housed in the old rig is, that it is a difficult job to do, and when done, sail cannot be made to claw off shore in case of parting the cables, dragging the anchors, or being in danger of fouling or being fouled. If ships are to be constructed for constant smooth seas and fine weather, by all means dispense with the new rigs. Take the case of the ship which was lately lost at the Cape of Good Hope, when nearly two hundred lives were lost. The ship dragged, and finally parted her chains, owing probably to having her topmasts and topgallant masts aloft, though the latter were housed; she attempted to make sail, and probably had first to reef her topsails, but they could not be properly set, owing to the housed topgallant masts being in the way; the ship miss-stayed for want of canvas, and soon went on the rocks in the

attempt to wear her. She had no foretopsail bent at the time; and this was, perhaps, owing to the great inconvenience of bending so large a sail in a gale of wind, with a small crew.

"Now it is highly probable that if this ship had been rigged after my plan, and sent her topgallant masts *on deck*, and housed her topmasts, her chains would have held on; or, if they parted, (the necessary precautions for setting the lower topsails being taken,) the ship would have clawed off, for the wind was not so violent as to make this very difficult in a good sailing ship; and with the topgallant masts aloft, but housed, sail could have easily been made on the ship. Now, I am rejoiced that Capt. Howes has made so great an improvement on the old rig, and I am sure that all who try it will find it so. But the advantages just named cannot fully be realized in his rig as compared to mine, with the masts abaft, though his ability to set a close-reefed topsail (the topmasts being aloft) would give him a slight advantage, provided the ship with my original rig did not house hers.

"But in case of being obliged by the orders of the harbor-master at the Cape, or at Mauritius, or Madras, to house topmasts, the ship with Howes's rig would be as helpless to get under weigh as a ship with the old rig. Again, a ship with my rig may cut away all above the lower caps, and still be able to make sail equal to double-reefed topsails and courses. With the topmasts abaft, the strain on the lower trestletrees is divided—and in the event of losing a topmast or sail, it can be more readily replaced in stormy weather than the old rig, mast and sail. Howes's rig also has this advantage, so far as the sails are concerned.

"My rig lessens the strain on the jibboom and on the foretopmast, because one important jib sets on the cap-stay to the bowsprit, and these cap-stays are most important auxiliaries to the safety of masts. In Howes's rig you have only the usual supporters.

"When I find an old seaman who has been a voyage in ships with my rig and the Howes's rig, who gives a preference, taking the utility and general appearance into consideration, to the latter, I shall begin to think I am riding one of my hobbies too strongly. Capt. Howes has a patent-right in his rig, and expects to get ten cents per ton from all who adopt it; his rig is cheaper in the first cost, and *perhaps* in the long run, than mine, by twenty or thirty cents per ton, and this will do much to introduce it; by stating this fact candidly, I hope to serve his interest.

"Excuse this long spun yarn, and believe me,

"Very truly yours,

"R. B. Forbes.

"'New-York, Friday, *Jan.* 12*th.*

"'Dear Sir:—I take much pleasure in enclosing an extract from Capt. Bunting's letter, relative to your rig.

"'My brother writes to me from Liverpool as follows:—" The 'Aurora' arrived on the 25th, all right; she came up the river under sail, and

looked extremely well; every one who saw her admired her very much. I am agreeably surprised to find that she looks so neat aloft."

"'Capt. Bunting says, "The ship is perfect, all I could wish for; carries a large cargo on a light draft of water, sails fast, steers beautifully, and leaks just enough to keep her sweet. I have got twelve knots out of her several times. One thing is certain, she sails faster and steers better than any ship I ever was in.

"The rig is complete, I cannot speak too highly of it; we have not called all hands to take in sail since we left, only to tack ship; we have no reefing to do except in extreme cases; our upper topsails are as handy to clew up and furl as topgallantsails in the old rig. The lower topsails we have not had to reef, and will not but seldom. I certainly can take care of the ship in squally and unsettled weather, with the watch, (or half of the general crew,) as well as all hands with the old rig.

"*I am very glad I did not adopt Howes's Rig;* I should have had 5½ feet more drop to my courses, and 4½ feet more hoist to my topgallantsails. I am not disappointed in any particular of the rig. It works charmingly.

"(Signed) R. L. BUNTING."

"'Very truly and respectfuly yours,

"'CORNELIUS GRINNELL.

"'To R. B. FORBES, Esq.'"

With reference to the comparative merits of the *Howe Rig*, it may be well to add a few remarks. In this rig the lower topsail-yard is fastened to the cap, and supported by an iron brace secured to the topmast-heel below. We do not consider the cap to be the most eligible point for slinging a heavy yard, the weight of which is added to the *ordinary doublings* of the masts, without the facilities of having *cap-stays*, as in Forbes's Rig, to secure the requisite strength at this important point. Besides, the upper topsail and topgallant sail are still *rather unhandy*, as compared to the latter rig, while the symmetry of the same is ruined by this imitation. The Howe rig is no doubt vastly more convenient than the old rig, and all who try it, like it for this reason, and because it costs much *less* to change from the old to the new rig than Forbes's, and something less in the first cost of a new ship. But for strength, safety, convenience and *symmetry*, Forbes's rig must be pronounced superior, far beyond the ratio of difference in cost.—[EDS.

IDENTIFYING A VESSEL UNDER THE UNITED STATES TONNAGE LAWS.

A SHIPBUILDER has communicated a recent exemplification of the *beauties* of our present tonnage system as follows:—Having finished a ship, he was called on to furnish the customary certificate of identity and survey, which he did; designating the length, breadth, *depth*, &c., as usual, in order that the register might be obtained. The surveyor had also furnished the owner with a description of the ship, giving her length and breadth, and setting down the depth of hold as equal to the *half breadth*, "according to law." Of course, the vessel "having more decks than one," there was a difference of several feet between the actual depth, as given by the builder, and that set down by the surveyor as the *legal* depth. The register could not be obtained until the builder's certificate was amended to read, certifying that the ship was no deeper than the half breadth.

On another occasion, it became necessary to get a Custom-House permit to remove a ship from one State into another, before the register was procured. The same builder gave a certificate descriptive of the vessel, also setting down the entire depth of hold. Yet, because it was greater than the *half breadth*, the permit was not granted; because, when the ship came to be surveyed, after being removed into the adjoining state, it would be found, in a *legal* point of view, that the depth would not be found equal to the *actual* number of feet given by the builder; hence the identity of the ship would be lost, and it would appear that *the same vessel had become another*, and might be seized for a violation of the Revenue Laws! The certificate was amended, as in the former instance, and all became right when that document represented a *falsehood!* Have we no legislators, but only politicians, in this country?

EVEN SAILING.—The ships "Fleet Wing," Captain Wood, and the "Meteor," Captain Pike, left Calcutta in company, Dec. 29, and entered this port together yesterday.—A remarkable case of even sailing.—*Boston Journal.*

THE NEW-YORK PACKET SHIP AURORA.

Having furnished a description of the superior rig of this ship, which we think is entitled to stand as an exponent of the best practice of rigging ships in the United States at the present time, we propose to enlarge upon the subject sufficiently to present a few particulars of the ship itself, with her dimensions, and the calculations of the rig, or the amount and distribution of propulsory power.

The "Aurora" was built for Cornelius Grinnell, in 1854, by Wm. H. Webb, of New-York, and designed for a first class packet-ship, which should be of comparatively light draught of water, a fully developed carrier, and a good sailer, qualities which her first trip to Liverpool has demonstrated her to possess in a very satisfactory degree. The model of the Aurora is well developed at the extremities; but with such skill, that the minimum resistance is obtained, and this is accomplished by adopting the "hollow water line," and easy section and diagonal line shape, within a few feet of the wood ends below water. The midship body is necessarily long, but is gracefully relieved of its sameness, to the greatest possible extent, by a fine sheer, which carries the eye to the extremities upon a lively curve.

Mr. Webb has furnished us with the dimensions as follows:—

Length on deck,....................................	200 feet.
Length on load line,.............................	195 "
Beam extreme,.....................................	42 "
Depth of hold,......................................	29 "
Tonnage (register),........................ 1,640	
Draught of water when launched, with all masts on end, standing rigging all set up, and the balance of spars, and one chain and anchor on deck was, forward end of ship,..............................	9 ft. 3 in.
At after end of ship,..............................	9 " 7 "
The keel, below timbers, is........................	24 inches.

We have, therefore, a draught of 7 feet 5 inches above base line, as the limit of the displacement, which must be conceded to be a very light draught for a wooden ship of the above dimensions. It is, at least, from 12 to 15 inches less than the

draught of some other ships of similar dimensions, also built for freighting ships, and designed expressly with reference to a light launching draught of water. The manner of accomplishing such a manifest gain in the carrying capacity, is by a systematic reduction of the enormous weight of surplus timber that commonly finds its way into a ship, without regard to a *proportionate* demand for strength in the various parts. Our experience has long ago satisfied us, that a scientific distribution of timber, with regard to the proportionate requirements of the several portions of a ship's hull for strength and utility, would vastly cheapen, while it strengthened and increased the durability of vessels. A proper tonnage law would not be long in bringing this subject, in its full proportions, before the ship-owners of this country. What is gained in the diminished *weight* of vessels, is counted in favor of *burthen* at every cargo, and may either be added to the freighting capacity, or to the speed, in sharpening the model as it may be preferred. The timbering room of this ship is 30 inches.*

From the dâta furnished, the displacement, or the weight of the ship Aurora, hull and spars, amounted to 1,050 gross tons, indicating a wise distribution of timber and materials of hull, and a combination of the elements, of great strength and durability. In this respect the Aurora stands in the highest class of American ships. We compute the displacement for cargo at 2,105 tons.

The following manifest by Capt. Bunting, exhibits the list of cargo taken on board the "Aurora" on her first passage to Liverpool:—

"1,375 very large bales of cotton, (not compressed;) 32,042 bushels of corn; 2,595 bushels of wheat; 4,198 barrels of flour; 129 hogsheads of tallow; 259 barrels of rosin; 147 barrels of oil-cake; 295 tierces of beef; 15 boxes of tobacco; 7.000 staves (gross, 1200 to the thousand;) 422 logs of cedar; 200 chests of tea; 11 bales of merchandise; 157 boxes of clocks; 3 bales of hops; 161 barrels of lard; 571 boxes of cheese; 56 cases of

* The reader will find, in Mr. Griffiths' Ship-Builder's Manual, published in 1853, a full and lucid exposition of the "proper distribution of materials for strength in vessels," together with the results of the author's investigations and experience on many other subjects connected with marine mechanism.

middles; 2,484 locust treenails; 90 tons of water in iron tanks; — shooks. Provisions for 40 men for 4 months, &c. Bulk of cargo alone, equal to 21,500 barrels of flour, (which would weigh, at 215 lbs. per barrel, equal to 2,063 tons gross.)

"Draught of water with above cargo, 21½ feet on an even keel.

"CAPT. R. L. BUNTING."

We will now give the stations of masts, and the length of spars, as we find them on the spar-draft. We have also worked out the calculations of propulsory power, regarding it of great value to arrive at a basis of comparison between the best practice of our builders now and in times past, in sparring successful ships. We may not hesitate to place the Aurora upon the record for reference as an example of her class and model. The masts are stationed as follows:—

	Feet.	In.
From the stem, at planksheer, to foremast, is	40	6
Foremast to mainmast,	70	4
Mainmast to mizzenmast,	52	11
Mizzenmast to cross seam,	34	7
Area of leading sails, equal to 22,470 sq. ft.		
Centre of effort of sails, forward of mid-length, 11.56 feet.		
Centre of effort of sails forward of centre of gravity of displacement, 11 "		
Vertical moment of sails, equal to 1382283		
Height of centre of effort, above load line, 61.51 "		

By these calculations it will be seen that each end of the model has been equally cared for, in the distribution of buoyancy, enabling the vessel to sail on an even trim, while at the same time the lifting power of the fore body has been so skillfully adjusted, as to admit of locating the centre of effort of sail more than eleven feet forward of the centre of buoyancy, and the centre of lateral resistance. It will be borne in mind, that the Aurora is not a clipper in model, and does not demand the centre of propulsion to be brought aft quite so near the latter point as in sharper fore bodies. The difference in the weather and lee lines of flotation, together with the preponderance of absolute resistance on the bow of the Aurora, the unavoidable peculiarities of her class of models, will doubtless bring the lateral forces of wind and water in equilibrium, when under

sail; and we are assured by Capt. Bunting, that in respect to steering and behavior at sea, no improvement could be made upon this fine ship. The day is rapidly passing away when it has been considered requisite to the success of a ship, or other vessel, that she should be sailed butt end foremost, or that the other end should hang down into the depths of the sea. In the Aurora we have an example of an even draught of water in conjunction with the finest steering qualities, and a high degree of speed, when the burthen is considered—qualities once thought to be incompatible, in the times when the bow was made full and globular, to grasp profitably at cargoes, and the stern was cut away to a skeig, in order to cling to safety in navigating the back of a high sea. In those days, the merchant modelled the forward end of the ship, and the captain modelled the after end. It has now fallen into the hands of the ship-builder, as it should do, and both ends are now adapted to carrying and steering, which is only another evidence, that when it becomes *one* man's business to build vessels for freighting purposes, and make them sail too, it will not be found a difficult task for such a man to honor his profession. The reader will find these remarks equally true if applied to the character of the schooner Challenge, of Lake Michigan, noticed in another article in the present number.

LIST OF SPARS.

The topmasts being forward of the mast-head, and the yard traversing the topmast instead of the mast-head.

	Whole length. Feet.	In.	Head. Feet.	In.	Diameter. Inches.	Inches.	Inches.
Made foremast	95	3	27	3	35½	22½	19½
" Topmast	57	....	7	6	16½	11¾	11½
" Topgallant	23	....			11½		
" Royal	17	....			10		
" Pole	9	....			6½	....	2¼
Made mainmast	98	3	27	3	35½	22½	19¼
" Topmast	57	....	7	8	16½	11¾	11½
" Topgallant	23	....			12		
" Royal	17	....			10		
" Pole	10	....			6½	....	2¼
Fore and main yards	80	arm, 3	9		22	11½	9½
Lower topsail "	70	" 3	9		17½	9½	7½

	Whole length. Feet.	In.	Head. Feet.	In.	Diameter. Inches.	Inches.	Inches.
Upper topsail yard	60	6	arm 4		15	8½	6¼
Topgallant "	45		" 2	3	10¾	5½	4½
Royal "	36		" 1	6	7½	3	1¾
Made mizzenmast	89	3	23	3	27½	17½	14½
Topmast	47	6	6		13½	9¼	9
Topgallant	19				9		
Royal	14				7½		
Pole	8				4¾		2
Yard	61		4		16	8½	6½
Lower topsail	52		3	9	13	7	5½
Upper "	43	6	3		10¼	5½	4
Topgallant	31		1	6	7	3½	2¾
Royal	24		1		5		2
Made bowsprit, out	30			34	32		

Jibboom, 27 ft., in'd end 11 in., cap 17 in., l'gth 14 ft. 6 in., out 11 in. dia.

Flying jibboom, length 17 ft. 4in., diameter 9 inches. Pole, length 3 ft. 6 inches, diameter 4 inches.

Spanker boom, length 50 feet. Pole, 2 feet, diameter 11 inches, at grummet 7 inches, at ends 8 inches and 3 inches.

Gaff 39 feet, pole 6 feet, diameter 9 inches, at grummet 5½ inches, at ends 8 inches and 2½ inches.

Spencer gaff 27 feet. Pole 3 feet, diameter 8 inches, ends 5½ and 2½ inches.

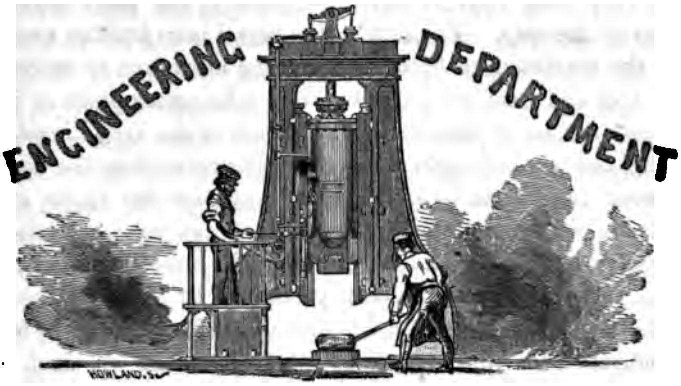
Trysail mast 32 feet, diameter 9½ inches, ends 8 and 3 inches.

Length of mast, below partners, forward..................27 ft.
" " Main.....................25 " 9 in.
" " Mizzen..................26 " 6 "

4 studding sail booms...............45 ft. 6 in......9½ in......5¾ "
4 " " ....40 " ......7¾ " ......4¾ "
2 " Yards...............26 " ......6½ " ......4 "
3 " " ....24 " .....6 " ......3¾ "
3 " " ....19 " ......5 " ......3¼ "
Martingale.......................15 " 6 "
Fore and main tops.................16 " 6 " .....Mizzen 13 ft. 3 "
Anchor davits......................26 " .....9½ in... 9 "
Fid holes of lower fore and main....... ......12+7½, mizzen 10¼+5⅝
" Topgallant " ....8¼+4⅝, " 6+3⅝

Spare lower yards.
" " Topsail yard.
" " Upper "
" " Topgallant "

Davit spreader.... ....27 feet......5½ inches......4¾ inches.



For The Nautical Magazine.

DESCRIPTION OF SCREW STEAM VESSEL "BARWON."

BY CHAS. H. HASWELL, C. E.

THIS vessel has been constructed by Messrs. JOHN BOURNE & Co., expressly for the Steam Coasting Trade of Australia, and she combines all previous improvements, with several others peculiar to herself, and not existing in any other vessel. She is of 485 tons burden, builder's measurement, and 100 nominal horse-power; but she has a house on deck, which greatly increases her available capacity, and the engine works much more powerfully than common engines, owing to improvements in its construction which have been introduced. The speed of the vessel, under steam alone, and without any aid from the sails, is 14 miles per hour—the vessel drawing eight feet of water. The displacement at 8 feet of water is 430 tons, and at 10 feet draught of water, 620 tons; at which draught, 270 tons of dead weight of cargo could be carried. The length of the vessel occupied by the engine and boiler, and 50 tons of coal, is only 33 feet; so that, besides extensive cabin accommodation, there are holds which will contain 270 tons of cargo. The cabins contain berths for 74 first-class, and 53 second-class passengers; and provision is made whereby the number of berths may be increased to 90 first-class and 58 second-class passengers. The after hold is so contrived, that, if necessary, it can be put in connection with the coal boxes, whereby coal may be carried

for a very long voyage, without disturbing the other arrangements of the ship. The hull of the vessel is so built as to combine the maximum of lightness with the maximum of strength. The keel and stem are formed of one continuous piece of iron, without scarphs or joinings. The bottom of the vessel is double throughout, a water-tight platform being carried on the top of the floors from stem to stern, which supports the bilges, gives longitudinal strength, and prevents the influx of water should the outer bottom get knocked in by the vessel getting upon rocks. The vessel is divided vertically by five water-tight bulkheads. The deck is made unusually strong, so as to be in equilibrium with the bottom of the ship: since the deck and the bottom of the ship constitute the upper and lower edges of a great hollow beam, which a ship in reality is; and the strength of the upper and lower portions of any beam should be so adjusted to each other as to keep the neutral axis as near the middle as possible. To give this necessary strength, a great portion of the deck area is strengthened with iron plates, riveted to one another, and also to the beams, before the wooden deck is laid on. The bolts which attach the wooden deck to the beams pass upwards from beneath, and are screwed into the wood; and the necks of these bolts are made conical, so that they may accurately fit the holes in the beams, and act as cogs or steady pins in preventing the deck from working on the beams, when the vessel is subjected to severe longitudinal strains. The bow and stern are strengthened by bulkheads and by breast-hook plates, securely riveted to the vessel's sides. The stern frame, which contains the propeller, and from which the rudder is hung, is forged in one piece; and in its upper and foremost corner it has a large palm forged upon it, like the palm of a vice, which is securely riveted to a breast-hook plate in the stern; thereby connecting the stern frame with the sides at a point where the vessel has breadth enough to give adequate lateral strength. The screw shaft passes through a pipe, which is affixed to four bulkheads, which pass upward from the keel to the breast-hook plate to which the palm of the stern frame is attached.

The screw is of a totally new description, which works with greater efficacy than common screws, and there is very little of

the usual vibratory motion at the stern. The sails and rigging, chains and anchors, and other fittings and furnishings of the ship, are of the best quality that can be obtained. There is a pump worked by the steam engine, to act as a fire engine, and which is fitted with a proper hose and nozzle; but besides this, there is a portable fire engine on wheels, which may be wheeled to any part of the ship, with suitable suction-pipe for casting over the ship's side. There are four boats in all, of which two are life-boats. The boats are furnished with masts and sails, besides oars, and the life-boats may have provisions, compasses, and all other things necessary for immediate use stowed away in them, so that nothing has to be sought for should their services be required.

The cabins are fitted up so as to combine comfort with elegance. They have the benefit of a novel and most efficient system of ventilation, by which the disagreeable closeness incident to steam-vessels is completely obviated, and all the lights are so planned as to obviate danger from fire. There is an upper and lower saloon, fitted up in rosewood and gold, and adorned with mirrors and glass paintings. The windows are fitted with stained glass, and the cushions of the sofas are covered with velvet. The bedding, plate, cutlery, china, glass, and other furnishings, are all of the best description, and have been manufactured expressly for this vessel, after much pains had been taken to select the most elegant designs.

SPECIFICATION OF SCREW STEAM-VESSEL "BARWON."

THE HULL.

Principal Dimensions.—	Feet.	Inch.
Length of keel and fore rake,	173	
Length of keel for tonnage,	158	6
Breadth of beam,	24	
Depth of hold,	13	6
Displacement to 8 feet draught, 430 tons.		
" 10 " " 620 "		
Tonnage (builder's measurement), 485 "		
Tonnage (register), 272 44-100		
Engine Room, 118 28-100		
Screw shaft space, 3 24-100		
Total tonnage (new measurement), tons, 393 96-100		
Nominal power, 100 horses.		

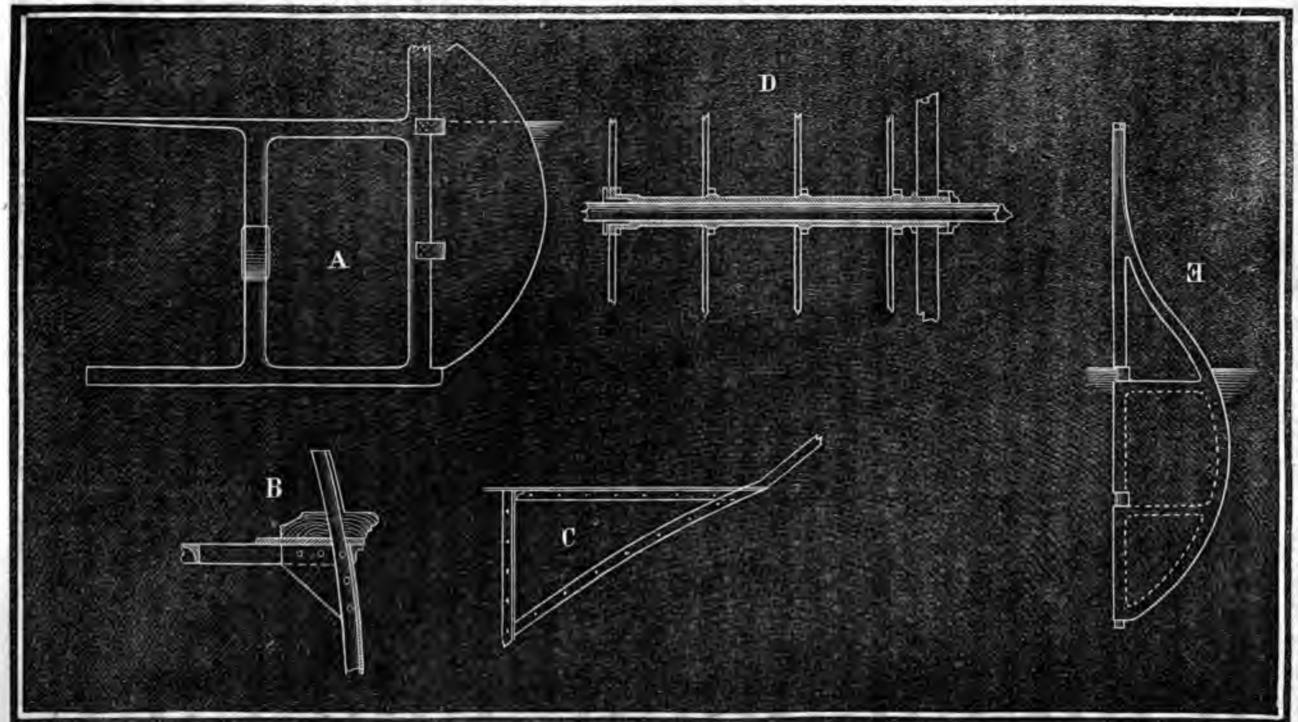
Keel.—Of best iron, 7 inches deep and ¾ thick, welded in one piece fr m end to end, and also to the stem, so that the stem and keel may be without scarphs or joinings. To be double riveted to the garboard strake throughout.

Stem.—Of best iron, 7 inches wide, and ¾ inch thick, formed in one piece and welded to the keel. To be double riveted throughout to the plating of the bow.

Stern Frames.—To be forged in one piece, of the best scrap iron, with aperture of a size adequate to admit the most approved screw; and the forging to be without scarphs or joinings in it; but the frame is to be scarphed to the keel with a long scarph, with planed joint, which is to be riveted with turned rivets, the holes being accurately reamed out, and the rivets driven in so as to fit accurately throughout their length. The scantling of the stern frame is to be 8 inches broad by 3 inches thick, with a projecting spur for the reception of the rudder heel; and a tapered piece is to be welded to the keel, so as to bring up the thickness of the keel gradually to that of the stern frame, to enable the plates to lie fair over the joint. On the foremost upper corner of the frame a palm is to be forged on, which is to be riveted to a strong breast-hook plate, so as to enable the stern frame to obtain a firm hold of the ship near the water-line, where the breadth is sufficient to resist lateral strains, which the stern frame has to withstand. [*See Fig. A.*]

The whole of the rivets passing through the stern-frame, for the attachment of the plating or otherwise, are to be turned rivets, and the holes are to be accurately reamed out before the rivets are inserted, in order that the rivets may bear throughout their whole length; since it has been found, by experience, that where this is not done, the rivets do not fit the holes in the middle; and as the usual process of riveting only tightens them at the ends, they work about in the hole in the thick iron when a strain is applied.

Stringer Plate.—A stringer plate, 18 inches wide and three-eighths thick, to run round the mouth of the ship, beneath the deck. This stringer plate is to be let down over the stanchions by having angular holes punched in it, through which the stanchions pass up; and the plate is to be secured to the outside


A
B
C
D
E

plating by a strong angle iron running round the mouth of the ship on the outside. [*See Fig. B.*]

The scuppers to be kept clear of this stringer plate, so as to obviate any diminution in the horizontal strength by the stringer plate being cut.

At the stern, the stringer plates are to run across at the end of the vessel, and are to be joined by the central plates, so as to form a firm plate iron connection beneath the deck, to give strength to the stern. The stern of the vessel is to be formed without windows; and from the overhanging plating of the counter knee-plates are to pass inward, and are to be riveted to the iron plating beneath the deck, so as to give effectual resisting power to the stern, should it be struck by a heavy sea. A plate-knee of this kind to be attached to every stern timber, so as to connect it with the iron plating beneath the deck.

ARRANGEMENTS FOR TRANSMISSION OF SCREW SHAFT AT STERN.

The shaft is to pass through a cast iron pipe, opening through the stern, and the leakage of water through the pipe is to be prevented by a stuffing-box and suitable packing. On the four aftermost frames bulkheads are to be carried up to about the level of the water, to bind together the sides of the vessel in that situation. Holes are to be cut in these bulkheads for the passage of the pipe, and iron rings, accurately bored out, are to be riveted to the bulkheads, to afford support to the pipe; the exterior of the pipe being turned to fit these rings, and being driven into its place, and then secured with a great nut outside the stern-post. The shaft is to bear on the internal surface of the pipe throughout, and is to be provided with expedients enabling it to be lubricated with soap and fresh water, instead of salt water being permitted to enter and corrode the shaft. The bulkheads which support the pipe are to connect with the breast-hook plate, to which the palm of the stern-frame is attached; whereby a combination of great strength in this usually weak part of screw vessels will be obtained. [*See Fig. D.*]

RUDDER.—The rudder is to be formed with two strong palms riveted on to the stock, so as to take the strain off the rivets, and is then to be plated in the usual manner. The rudder stock to be 5 inches diameter at the head, and to be made of the best iron. [*See Fig. E.*]

Frames.—Of angle iron, $2\frac{1}{2}$ by $2\frac{1}{2}$, by $\frac{3}{8}$, spaced 3 feet apart. To run up to form stanchions for the bulwarks, and to be fitted with reverse angle irons, where necessary, for the attachment of the lining of the holds.

Beams.—The main deck beams, as also the beams for the main and fore cabin soles and sole of cabins for the crew, to be of angle iron, $2\frac{1}{2}$ by $3\frac{1}{2}$ by $\frac{3}{8}$. A main deck beam is to go to every frame, and beam and frame are to be attached to one another by angular plates or knees, securely riveted, so as to form an internal hoop. A between deck beam is also to go to every frame, so far as the between decks extend, and is to be similarly secured by plate iron knees.

Floors.—Of plate iron, 2 feet deep and $\frac{1}{4}$ thick, with angle irons riveted along the top of each floor, for the attachment of the platform. A man-hole is to be cut in each floor-plate, to establish a communication beneath the platform from end to end of each compartment formed by the water-tight bulkheads.

Plating.—Garboard strake of $\frac{1}{2}$ inch plate; two strakes next garboard strake, $\frac{3}{8}$; six next strakes, of $\frac{1}{4}$ inch plate; one strake at gunwale, $\frac{3}{8}$ plate; and bulwarks, $\frac{3}{16}$ plate. Garboard strake to be double riveted to keel with $\frac{7}{8}$ rivets. All abut-ends of the plates to be double riveted; horizontal landings to be single riveted. All rivets to be counter-sunk on the outside, and all landings to be calked.

Central Plates.—Two plates, each 2 feet broad and $\frac{1}{2}$ inch thick, to run fore and aft from bow to stern, beneath the deck, one on each side of hatchways, and to be riveted securely to every deck beam. The abut-ends of these plates, and also of the stringer plates, are to be double riveted and counter-sunk. The central plates are to join the stringer plates near the bow, and after affording effectual support to the windlass bitts, are to join with the stringer plates, so as to form a breast-hook plate in the bow, beneath the deck. [*See Fig. C.*]

Bulkheads.—The vessel is to be constructed with five water-tight bulkheads; and, in addition, is to have short bulkheads for strengthening the vessel in the bow and stern. The bulkheads are to extend downwards from the deck to the outside skin, and are to have angle irons on each side, to secure them to the sides

of the ship, and to be made perfectly water-tight. The bulkheads are to be made of plate iron, $\frac{1}{4}$ inch thick, stiffened by vertical angle irons of the same scantling and pitch as the frames of the ship, and are to be attached by horizontal angle irons to the between decks of the ship. The bulkhead abaft the fore hatchway is to be cut away beneath the fore cabin sole, so as to continue the hold; but the fore cabin sole is to be made water-tight, so as to answer the purpose of a bulkhead in this situation.

Platform or Inner Bottom.—A platform or inner bottom of iron plates $\frac{1}{4}$ inch thick, riveted together and to the sides, so as to be water-tight, is to be carried on the top of the floors from stem to stern. The bilge pumps are to draw from beneath this platform, into which space any water which may be spilled in the hold is to be conducted. A wooden water-way, laid along the edge of the platform, is to be fitted to the side and calked; and a gutter is to be hollowed in it to conduct into the timbers any water which may come down the ship's side, whether from the condensation of vapor in the hold or otherwise. Suitable cocks are to be provided, with handles rising above the water-line, to enable the communication between the space beneath the platform and the space above it to be promptly cut off, should the vessel get upon rocks or the bottom be knocked in.

Stanchions for the Beams.—Every alternate beam is to be fitted with a strong stanchion of American oak, 4 inches square where there are between decks, and 5 inches square where there are no between decks. The stanchions are to be so bolted to the beams at head and keel as to be adapted for withstanding both a pushing and a pulling strain. In the wider parts of the ship the stanchions are not to be set in the middle, but are to be set alternately at one-third of the distance from the end of the beam, so as to have a zigzag arrangement on the ground plan. The preservation of the strength of the stanchions throughout the vessel is to be carefully attended to, since the stanchions perform a highly essential part in maintaining the longitudinal strength of the vessel.

Breasthook Plates.—Three breasthook plates to be fitted in the bow and one in the stern, in addition to the iron plating beneath the main deck at the stern, already described. Those on

deck to be $\frac{3}{8}$ inch, and those below $\frac{1}{4}$ inch thick. These plates to be securely riveted to the sides of the vessel and to the frames.

Filling at Forefoot and Stern.—The thin parts of the vessel at the forefoot and stern are to be run up with a mixture of Roman cement and sand; so as to prevent leaks, exclude bilge-water and dirt, and make the vessel solid in those parts.

Steering Gear.—The steering wheel is to be of polished brass, with polished malleable iron spokes introduced. The standards for the wheel-shaft are to be of cast iron, bushed with brass. The tiller is to be of malleable iron, turned at the end, to enable a brass swivelling eye to slide on it, so as to keep the rope always tight. The tiller rope is to be made of hide of the best description. The head of the rudder-post is to be so formed that a spare tiller may be shipped should the steering gear happen to get deranged; and a spare tiller proper for this purpose is to be supplied.

(*To be continued.*)

"OLD SALT" UPON MARITIME JURIES.

The following interesting letter from our correspondent, very aptly sets forth the assumption, that nautical mechanics are incompetent to determine by experience the discrepancies in the science or practice of their art. For his information, we may remark, that the Ship Builder's Convention adjourned to meet again, but have not met according to appointment.—[Eds.

For the Nautical Magazine.

Messrs. Editors:—I have been waiting patiently to see if the mechanics, engineers, and mariners of this country would not hold a Convention of their members, for the purpose of determining upon some measures to be recommended as the basis of an amendment to the present law, to be laid before Congress for adoption, relative to the better security against maritime disasters, but I have waited in vain. During the interval which has elapsed since the loss of the ill-fated Arctic, this community has had thrust upon them *two inquests* of *juries*, convoked for the purpose of determining *cause* and *consequence* in the safety of navigation; but how mortifying to the practical navigator must it be, to witness such ebullitions of ignorance upon subjects

of so much consequence to the safety of travellers by sea! When shall these would-be philosophers learn that a ship is not a floating warehouse, as they are wont to suppose? Why is it that the judge leaves his bench, the lawyer his client, and the merchant his counting-room, to attend to the cause and effect of nautical disasters? Is it because they suppose that the mechanics, engineers and ship-masters are incompetent to attend to their own interests? And are not the constructors and navigators of vessels most deeply interested? Perhaps it is because they think that inasmuch as we are not knights of the pen, or that because we are not on 'change every day, we are, therefore, of little consequence, and our knowledge of no importance to the world.

Now, Messrs. Editors, I propose to throw all such juries, with their verdicts, overboard; they are the *Jonahs*, and we shall never have a fair wind, or a full allowance, so long as practical men allow them to manage the vessel while on her voyage to a port of safety and improvement in nautical construction. Why did not the United States District Court select *practical* men for this jury, which have so signally failed to demonstrate any principle based on feasibility? Why not at once call a Convention of practical men, to meet before the next session of Congress, who are competent to report something worth having—beginning, where they doubtless would, with the *Life-Boat Principle of Construction.* Can you not tell us what became of the Convention of Ship Builders which met in Maine about a year ago?

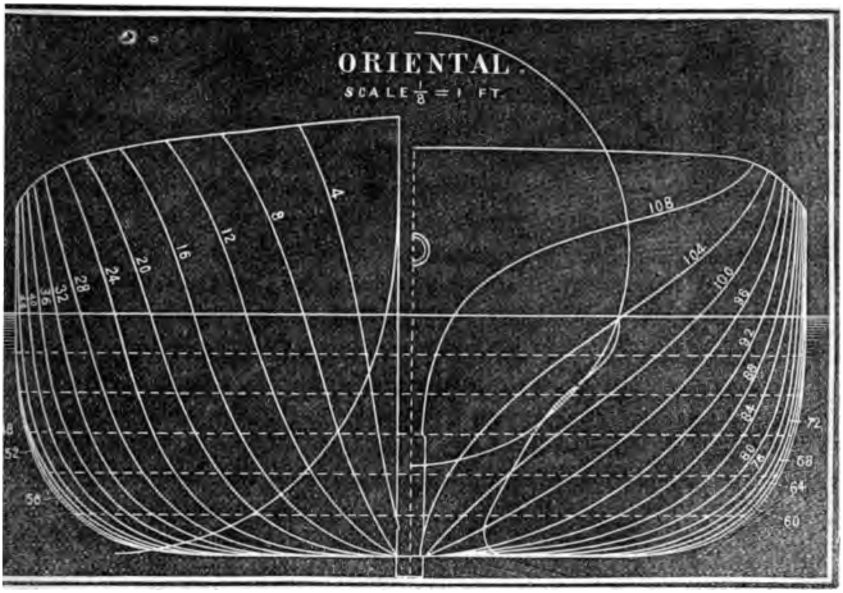
Yours truly,

OLD SALT.

Fast Sailing.—The performances of the fine clipper ship Spirit of the Times, on her late passage from Valparaiso to Baltimore, Md., have been seldom equalled by the ships of this or any other country. She left Valparaiso with a full cargo of copper ore, on the 26th of November last, and in nineteen days was off the Falkland Islands. Her log-book shows some very swift sailing, having averaged repeatedly fifteen and sixteen miles per hour—in one instance she made 217 miles in thirteen hours, more than 17 knots per hour.

DRAUGHT AND CALCULATIONS OF THE LAKE PROPELLER "ORIENTAL."

The "Oriental" was built at Buffalo, in 1854, by Messrs. Bidwell and Banta, and is the largest screw vessel on the Lakes. She is of 950 tons register, and carries 750 tons of freight. The weight of engine, boiler, and 100 tons of coal, is equal to 200 tons. The loaded draught of water is 11 feet. Average speed when loaded is equal to 9 miles per hour in good weather, but she runs much faster and steers better when light.



The semi-circle described in the engraving of body-plan represents the periphery and position of the screw propeller as now fitted. The first screw was made 22 feet in diameter, but was impracticable for use—the vessel refusing to steer. The present screw was found best adapted for propulsory purposes, having less diameter and pitch; and no difficulty is now experienced in working ship. It will be observed that the dip of screw-blades is small (60 square feet immersed when loaded) in proportion to

the transverse area of midship section, (equal to 297 feet) and the bulk of displacement. The engines are also light, weighing less than 100 tons, working steam at a moderate pressure, and consuming only three-fourths of a ton of coal per hour. The weight of vessel and cargo, at 11 feet draught of water, may be set down at 1,400 tons gross. Under such circumstances, an extraordinary speed cannot be expected.

The stern is shaped and built like that of a yawl boat, in order to permit the wheel to extend above the transom ; the guards being carried around the stern as usual.

We have not yet been placed in possession of the particulars of her construction; but in connection with the draught, and the remarks concerning her engines, and also those of the propellers "Buffalo" and "International," to be found in the following article, page 141, we give the calculations of hull, as we have worked them out from the draught.

CALCULATIONS.

		Feet.
Length on load line for calculations,........................		217
Height of same above base line,...........................		10
Height of planksheer above base line,.......................		14.50
Breadth moulded on load line at dead flat,..................		33
Breadth extreme,..		33.66
Area of load water-line section in square feet,........	5629.28	
Exponent of the same,..............................	0.757	
Centre of gravity of same abaft mid-length,................		8.58
Area of greatest transverse section (moulded,) sq. feet,	296.77	
Exponent of the same (full).........................	0.90	
Location abaft mid-length on load line,.....		4.50
Moulded displacement in cubic feet,..............	45068.86	
" " in tons gross,..............	1287.68	
Exponent of displacement,.........................	0.63	
Centre of gravity of same below load line,.................		4 34
Centre of gravity of same abaft mid-length,................		5.77
Moment of stability (s. 2-3 y_3 d x)=3919,69		
Height of *meta centre* above buoyancy,.....................		8.69

The "Oriental" was built for freighting purposes only. Her upper deck extends the entire length of vessel, as usual in Lake propellers, upon which the cabins for the accommodation of officers and crew, only, are constructed.

ON ELEVATED SCREW-PROPELLERS.

BY THOMAS D. STETSON, M. E.

A SCREW revolved in water exhibits a tendency to move itself endwise in one direction, while it forces the water toward an opposite point. A screw working in a nut developes a similar tendency, but one is generally constrained, and the other allowed to yield. In the case of the screw-propeller, neither the screw nor the fluid is thus confined, and it becomes an object of great importance to decrease the movement of the water, and, consequently, increase that of the screw. The same amount of force, whatever it may be, is developed in each direction, since whatever energy is displayed by the screw in moving the vessel is derived from its hold on the water; and as a given force exerted upon a large quantity will move it to a less distance than a smaller mass, it becomes desirable to work upon as large a quantity of water as possible. The only feasible method of compassing this end is by enlarging the area of the screw; and as the central portion or stock is but useless metal for propulsory purposes, the proper screw-propeller becomes a very broad thin thread, wound spirally about a small axis or shaft.

We have now attained a general idea of the theory of screw propelling; but the large amount of rubbing surface thus presented to the water, next demands attention, and we find by experiment that it is possible to make the screw too long. By successively cutting away the after extremity of the thread or blade, we discover that a very short screw, less in fact than one complete revolution, although somewhat less firm in its hold upon the fluid, and liable in consequence to a greater amount of "slip," is more efficient in consequence of its diminished friction. But a short screw with one thread is very irregular and "one-sided" in its action, and the discovery of this difficulty leads to the adoption of screws with two threads, the addition allowing of a corresponding shortening of the screw, so that the amount of surface is not increased.

The usual location of the screw-propeller is at the stern of the vessel, at which place there is always more or less "dead water," or water which is in motion following the vessel. The perpen-

dicular extremity or stern-post is more immediately accompanied by this, and a two-bladed screw will consequently "thrust" more efficiently when its blades are in a perpendicular than when in a horizontal line. This variable condition of the water results in a series of jerks, which it is desirable to avoid by still further increasing the number of blades, and of course decreasing still further the length of the screw.

But it is necessary to retain sufficient length to give strength to the centre; and in addition to this consideration, a new difficulty is experienced as the number of blades increase. This is the resistance of the water to their cutting or forward edges, which is increased by each addition, and, aside from the various practical difficulties in the way of an indefinite increase, limits the number of blades on the ordinary screw-propeller to from two to four.

The angle made by the acting surface, or the relation of pitch to diameter, is the next point to be considered, and this we find to depend, theoretically, on the amount of friction between water and metallic surfaces. To determine these points, broad, thin disks have been accurately mounted by experimenters on delicate shafts, and revolved with different degrees of rapidity, and under the pressure of different heads of water. The results have proved the desirability of a large screw with a comparatively small pitch, but revolving rapidly. The English in some degree attain this end by employing gear, but the gearing itself is so far objectionable, as to induce American Engineers generally to forego its advantages, and construct slower screws with larger pitches, and connect the engines directly to the shaft.

Avoiding entirely a host of important questions as irrelevant to our present subject, we shall assume that the foregoing positions are understood and assented to as self-evident, although every week brings forth ridiculous inventions, which prove that these simple laws have never yet been published, or at least sufficiently promulgated. Let us briefly recapitulate them.

The screw tends to move itself in one direction, and the water which it acts on in another, and a portion of the power of the engine is consumed in producing each of these effects. It is de-

sirable to make this endwise velocity of the screw, and consequently of the vessel, as great as possible. To this end it is desirable to diminish the velocity of the water, or in engineering language, to diminish the "slip" of the screw. Increasing the diameter will accomplish this end, shortening the screw will diminish its friction upon the water, and decrease the weight, while increasing the number of threads to a certain extent, will equalize its action and prevent vibration. In addition to these considerations, the impracticability of allowing large and powerful engines to revolve rapidly, necessitates the existence either of a large pitch or the intervention of gearing. But a large pitch renders still more imperative the demand for great diameter; and thus we have two powerful inducements to obtain all possible latitude in this direction: first, the necessity for acting on a large quantity of water, and second, the desire to act on the water at as favorable an angle as possible. As it would be evidently unsafe and impolitic to allow any portion of the screw to project below the keel, it has been considered practicable to obtain a diameter but little exceeding the loaded draught of the vessel.*

The "Shepherd Iron Works," at Buffalo, were the first to construct, and were probably the first seriously to propose, a great increase of diameter by raising a considerable portion of the screw above the surface; a practice now almost universal

* The "Monumental City," with a draught of 12 feet, has a propeller with a diameter of 12 feet; the "Albatross," draught 10 feet 6 inches, diameter of prop 10 feet; the "Pioneer," draught 19 feet, prop 16 feet; "John Hancock," draught 10 feet 6 inches. prop 8 feet 8 inches; "Constitution," draught 11 feet, prop 10 feet 4 inches; "Union," draught 11 feet, prop 10 feet; "Rescue," (a tug-boat in New-York harbor,) draught 9 feet 9 inches, prop 8 feet 2 inches; "Alleghany," (United States War Steamer,) draught 15 feet, prop 13 feet 6 inches; "Sarah Sands," draught 15 feet, diameter of prop 14 feet. English screws, although geared up to such extent that the pitch but very slightly exceeds the diameter, retain about the same proportion to the draught,—the "Andes" and "Alps" (Cunard) have a draught of about 17 feet, and a diameter of prop 14 feet; the "Santander," draught 9 feet, prop 8 feet; and the "Agamemnon," (line-of-battle ship,) draught 20 feet, diameter of propeller 18 feet. These are all cases selected at random, there being cases like the "Massachusetts," (auxiliary steam, U. S. Navy,) where the draught exceeds the diameter of propeller in the proportion of about 15 to 9½. T. D. S.

on the upper lakes, and deserving of more extensive diffusion where screw-propelling is adopted. As an example of the extent to which this class of steamers are in use in these inland waters, the fact may be cited, that these works alone have constructed, within the five years last past, over one hundred screw-propellers: the style universally in vogue being constructed by bolting rolled iron blades upon short arms projecting from a stout cast iron centre. The credit of the innovation belongs unhesitatingly to Mr. Horatio O. Perry, the chief engineer of the works, who, in 1850, designed the propeller "Buffalo," with a screw more than half out of water, and she immediately proved herself one of the fastest and most popular on the lakes. It is needless to recur to the gratuitous opinions expressed at the time with regard to her probable success. They were the same as always encounter any new enterprise.

The "International," which served as a ferry-boat from Black Rock to Brantford, at the upper extremity of the Niagara River, has doubtless attracted the attention of all observing travellers upon that railroad; her shaft being raised some two feet clear above the surface of the river. More recently, the "Oriental," a vessel of some 950 tons register, has been made the subject of some unsuccessful experiments in other particulars, but is now performing with most unqualified success with a screw of the same construction, raised nearly or quite two-thirds out of water, although her draft is such as would allow a deeper immersion if desirable.

A little reflection will show more fully the considerations impelling to this position. The central hub, the arms, bolt-heads, &c., so far from being efficient as propelling surface, are actually and seriously an incumbrance on the vessel's progress when immersed. The portion of screw working in the air at any given time is certainly of no avail in propelling, nor is it, on the contrary, any incumbrance, except by its weight, while of two screws equally immersed, that with the greater diameter will present a considerably larger immersed surface, and the only objectionable features will be its weight and tendency to veer the vessel to one side. The force of the first objection is much diminished by the light construction of the screw; the iron blades being

rolled for the purpose, and made of a thickness decreasing towards the periphery; while the second objection is practically futile, the broad rudder of these steamers being held only about four inches out of the central line to steer the vessel in a straight course, when moving by steam alone.

I conclude this article with a few statistics of the vessels in which this principle is carried to the highest degree: the "International," of 473 tons register (burned last winter in Niagara River), the "Buffalo," 689 tons, and the "Oriental," of 950 tons, all three being impelled by single non-condensing engines standing vertically over the shaft.

INTERNATIONAL.

Diameter of cylinder,.................................. 33 inches.
Stroke of piston,.................................. 4 feet.
Diameter of screw,.................................. 17 "
Pitch of " .... 23 "
Pressure of steam, 75 lbs. above atmosphere, cut off at half stroke.
Revolutions, 46 per minute; average speed, 11½ statute miles per hour.
One tubular boiler, with drop return flues.
Weight of cast-iron centre of screw,.................. 9,500 lbs.
" blades,.................................. 4,800 "
Total weight of screw,..................................14,300 "
Draught of vessel loaded,..........................8 feet.

BUFFALO.

Diameter of cylinder,.................................. 32 inches.
Stroke of piston,.................................. 4 feet.
Diameter of screw,.................................. 15 "
Pitch of " .... 23 "
Average revolutions per minute,...................... 42
Average speed, 10 statute miles per hour.
One tubular boiler, up return.
Burns one half ton of coal per hour.
Weight of screw centre,.................................. 9,000 lbs.
" " blades,.................................. 3,600 "
Total weight,.................................. 12,600 "
Draught loaded,.................................. 10 feet.

THE ORIENTAL

Has a direct acting engine, of the style generally known as "square" engines, but called by some in the south "cross-head" engines. It stands vertically over the centre shaft.

Diameter of cylinder,.................................. 36 inches.
Stroke of piston,.................................. 4 ft. 8 inches.
Diameter of screw (six bladed),...................... 18 feet.
Pitch of " .... 23 "
Length of screw, 26 inches; length of hub, 30 inches.
Pressure of steam, 50 to 55 lbs. above atmosphere, cut off at half stroke.
Average revolutions, 42 per minute.

One drop flue boiler, 21½ feet long; shell, 10 feet diameter, with 12 large flues above and 186 return tubes below, each 3½ inches diameter. Grate surface, 54 feet. Fire and flue surface, 2651. Burns ¾ ton of bituminous coal per hour. The centre of the shaft is 12 feet 6 inches above the upper surface of the keel. Draught, loaded, 11 feet.

The "Oriental" carries 750 tons of freight, which, with the weight of her engines, boilers, and fuel, amounting to some 200 tons additional, shows her capable of carrying full up to her tonnage. Her speed, loaded, is about 9 miles per hour.

The slip of the screw of the "International" is, by these data, only about 5 per cent., that of the "Buffalo" only about 9, and that of the "Oriental" about 22 per cent.; the former being in all cases true screws. More careful notes must be taken before exact estimates can be formed of the amount of slip generally to be expected in screws so proportioned.

For the Nautical Magazine.

THE PRACTICABILITY OF SIDE-SCREW PROPULSION.

MESSRS. GRIFFITHS & BATES:

The interest which you have taken in my plan, of applying the screw power of steam vessels at the sides instead of the stern, has given me great satisfaction; and, with your permission, I would include another scientific journal of New-York, in the same, or a similar remark. I allude to the *Scientific American.* With your remarks upon the advantages secured by my invention, I am much pleased, and have only this to say with you, that whenever it becomes demonstrated, as it is in a fair way to be, that *elevated screw propulsion* is superior to the same power immersed, it will follow that the application will be changed from the stern to the *sides.*

As you have not yet given the dimensions of the Baltic, I will furnish the same:

Length on deck,	230 feet.
Breadth of beam,	30 "
Depth of hold,	12½ "

Having published the engineer's endorsement of a statement of the performance of the Baltic, from Buffalo to Cleveland, July 22d, 1854, would it not be well to show your readers what that statement is? The following is from the *Buffalo Democracy:*

"WHITTAKER'S SIDE-PROPELLERS.—We are disposed to attach very great consequence to the application of steam power, employed upon the Baltic, upon this Lake. At our request, Capt. Whittaker has prepared the following memoranda of his invention and its operation. We solicit for it the attention of naval constructors and engineers.

"The Baltic left Buffalo, June 22d, 1854,—average speed to Cleveland (distance 180 miles,) 11 miles per hour; pressure of steam carried on starboard boiler, from 35 to 40 pounds; on larboard boiler, from 45 to 55 pounds number of revolutions per minute on larboard engine, from 60 to 72; number of revolutions on starboard engine, from 44 to 55; average steam carried on the two boilers, less than 45 pounds.

"The Baltic should have a boiler sufficient to carry 80 pounds of steam when running. Notwithstanding the low steam she carried, she ran at a higher rate of speed than other propellers carrying 75 pounds of steam. The Baltic's engines work steam and water, when they should work dry steam, which is a loss of power. The cause is supposed to be small steam pipes. The unequal pressure of steam on the two boilers, shows clearly a loss of power, as they do not produce the same number of revolutions and travel of wheel. We are aware that the boilers and engines should be so connected, with feed and steam pipes, that they should work equal pressure, and the same number of revolutions per minute; and we should so arrange all passage boats, and also freight vessels. Notwithstanding all of the above losses, the application of the propellers upon two sides of the Baltic, work nearly one-third more power, with the same amount of steam, than the stern wheel propeller. As an evidence of the improvement and increase of power over the paddle wheel, we will compare the Baltic's running with the steamboat Michigan's, a boat of much less tonnage and a less draught of water. She has a condensing beam engine of 10 feet stroke, and 44 inch cylinder, new boilers, capable of carrying 30 pounds of steam with safety, and we have no doubt they did carry near that amount, when running with the Baltic on the 22d inst. The Michigan was beaten about one mile an hour by the Baltic. Dimensions of the Baltic's engines, 36 inch stroke and 26 inch cylinder. We are of the opinion that the Baltic's boilers are capable of keeping up 60 pounds of steam, when running. Her speed is quite sufficient for a business boat, when carrying 45 pounds of steam. Her engines, propellers, brackets, and guards, have been well tested, light and loaded, in gales of wind and heavy seas. On her last trip from Chicago, she encountered a heavy gale of wind, and a heavy sea, with a cargo of 30,000 bushels of oats, and 165 head of fat cattle. Her engines, propellers, brackets, and guards, stood firmly; notwithstanding she was changed from a paddle-wheel boat, with very different guards to those which we would place upon new boats. Another great advantage we find in the side propeller over the paddle-wheel boat and the stern-wheel propellers—the propeller in the stern causes the vessel to roll

much more than the paddle-wheel boat, while the application of propellers to the side, causes the boat to roll much less than paddle-wheel boats, as is already proven in the performance of the Baltic, in gales of wind and heavy sea. The reason is, that the propeller lifts the boat when half of the wheel is kept above the water-line; when we stop one engine, the one in motion will lift that side of the boat about one foot.

"The proof of an improvement in the application of steam, is in the amount of power produced with the least steam. In the application of steam to the side propellers in the Baltic, we find that 45 pounds of steam produce as much power and speed as the stern wheel propeller does when carrying 75 pounds of steam. Another important advantage is, that we can apply as many propellers upon the sides of light, sharp passage boats as we please; they will work full power, without interfering with each other, and will occupy but very little room.

"The speed of the Baltic is as great, when carrying 45 pounds of steam, applied to her side propellers, as it was with her paddle-wheel engine, when carrying 100 pounds of steam. Her paddle-wheel engines weighed about 200 tons more than the present engines, and had double the power of the present engines of the Baltic. The present engines and propellers occupy no part of the hull of the boat, and but one-half of the space of the paddle-wheels. In river boats, we would place the engines, wheels, and boilers in the space the wheels now occupy. In case, even, two engines and two propellers were used, they would give boats of the Mississippi and its tributaries, the entire room of the deck and hull for freight, and save from one to two hundred tons weight of engines. All large, sharp passage boats should have from four to six propellers to give them a very high rate of speed. HARRY WHITTAKER."

I also ask your attention to the following statement of opinions, made by the best vessel and engine builders of Buffalo, respecting the feasibility of my improvement, before it was tried on the Baltic and proved:

"We have been asked, by Capt. H. Whittaker, of Buffalo, our opinion as to the practicability of a plan for building a steamer with a screw propeller on each side of the vessel, at the place where paddle-wheels are usually placed.

"Capt. Whittaker speaks of a boat 215 feet in length, and 30 feet beam, that being the dimensions of a boat now building for Mr. Crooker, (the Garden City,) with two high-pressure engines, 27+42 inches cylinder, with 14 feet wheels (or screws.)

"It would be practicable to run such engines at a speed of 90 or 100 revolutions per minute, to drive wheels (or screws) that would lead enough to travel; at 90 revolutions, twenty-five miles per hour, or at 100 revolutions, twenty-eight miles per hour.

"Judging from our investigation of the amount of slip of the wheels,

which are now used on the propellers Buffalo and Mayflower, on the Lakes, it does not appear to us that on a light boat for passengers, such as proposed above, that the slip of wheels, like those spoken of for such boat, would be over the half of one mile per hour.

"The cost of such machinery for the proposed boat, would be about the same as a low pressure engine and boilers for such boat; and it is possible that they might drive the boat a higher speed with less fuel.

"The most reliable data, however, for persons desirous to form an opinion of the probable success of the proposed plan, in driving a steamer at high speed, by screws instead of paddle-wheels, would be to investigate thoroughly the performances for the past season, of the two propellers spoken of above.

"When looking at the heavy build of said vessels, their unfavorable models for speed, the large loads of freight they are capable of carrying and have carried, and the small amount of fuel that they have consumed, it seems to us, that desirable results would follow in constructing a steamer as proposed by Capt. Whittaker.

"John D. Shepherd,
For Shepherd Iron Works.
" H. O. Perry, (Engineer,)
" J. W. Banta, (Ship-builder.)

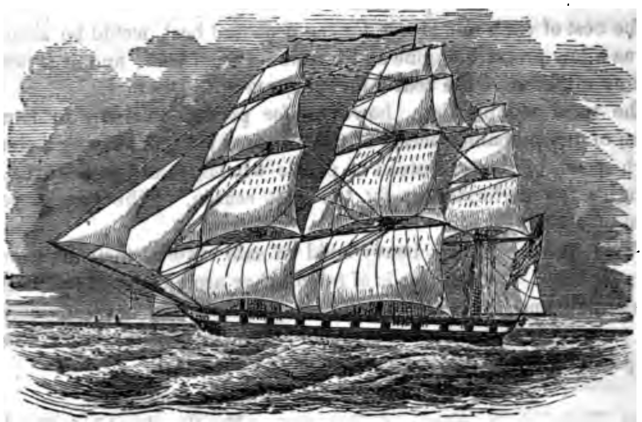
" Buffalo, Dec. 4, 1852."

In conclusion permit me to add, that the owner of the Baltic has refused to take less than $18,000 for a season charter, which indicates his appreciation of her usefulness, while he values her at $40,000. As a paddle-wheel boat, she could earn nothing; but only run in debt. Last year she cleared over $6,000, under very unfavorable circumstances. In reply to a proposal of $12,000, which I made a charter of the Baltic, her owner writes me that " she ought to earn double that sum" in a certain trade.

H. Whittaker.

Seamen and Wages.—Sailors continue in very small supply, but there is no further change in rates. In consequence of the difficulty of supplying the want of men, the Secretary of the Navy offers, in addition to the present liberal wages, a bounty of twenty dollars to all seamen, and fifteen dollars to all ordinary seamen, who will enlist for three years, within the next sixty days.

Nautical Department.



PHYSICAL GEOGRAPHY OF THE SEA.

In the progress of human knowledge as it is gathered from the ample fields of nature, through the laborious and systematic investigations of philosophers, it seldom falls to the lot of a single individual to take up one of the grandest, most beautiful, and useful departments of research, and become its popular champion. On the contrary, it is too frequently the case, that even the unassuming, silent seeker after truth, is interrupted in the freedom of his intellectual labors by the raillery of skeptics, if not frowned into obscurity by the blasting sirocco of bigots. But for the honor of perverse humanity, the finger of the reformer, the philosopher, or the man of progress, does not always direct in vain.

Within the boundless scope of a universe, overflowing with truths, there are many subjects which most men can approach, free of the warping influences of prejudice, and store their minds with its refreshing facts, expanding their finite capabilities, and preparing room for an enlarged appreciation of the means of progress.

Such is the *Physical Geography and Meteorology of the Sea,* than which, a more delightful field for philosophical investiga-

tion, for useful and honorable labor, abounding with the elements of useful and practical results, never engaged the attention of man. The winds and currents, and physical conformation of the oceans of our globe, containing facts most deeply interesting to commerce, being hitherto an unexplored department of nature, it might fairly be expected, that any undertaking to unravel their mysteries, would be regarded with no little interest by philosophers and philanthropists, by good and wise men in all conditions of life, and in all parts of the world. It is, therefore, highly gratifying to find that the intelligent and indefatigable genius which has been called to preside over the above investigations, as encouraged by the enlightened authority of our Government at Washington, has met the sympathy, assistance, and approbation of his fellows on every hand. To the glorious enterprise of Lieut. Maury, backed by the good sense of Congress, and the citizens of the United States, the whole world will be benefited beyond the most sanguine conception. It is thus that an enlarged beneficence on the part of nations and communities, in behalf of science and the progress of human knowledge, that the human mind is elevated to true dignity and moral grandeur. Our only regret is that our MAURYS, in other departments of science, have been less fortunate in securing the countenance of mankind, in accomplishing similar objects in the great work of human elevation, through the cultivation of a rich acquaintance with the truths of the universe.

Lieut. Maury's field is the sea, its winds and currents, and its physical geography. From his "*Wind and Current Charts*," now in the sixth edition, we purpose to give our readers, from time to time, information of what has been accomplished under his superintendence, and at present shall select the cruises of the United States surveying schooner Taney, and brig Dolphin, which were commissioned to test new routes, and search for Vigias rocks, and false dangers, in the Atlantic Ocean. The former vessel, under command of Lieut. J. C. Walsh, sailed in 1849, but unfortunately proved unseaworthy after reaching Porto Praya, and was compelled to return to the United States. The brig Dolphin, Lieut. S. P. Lee, commanding, sailed on her cruise of exploration in October, 1851. Lieut. Lee's cruise

was from the United States over to Cape de Verde Islands, thence southwardly into the supposed volcanic region about the equator, in which he found deep water, and no volcanic indications, thence to the Rocas, on the coast of Brazil. This dangerous shoal, which lies hard by the track of vessels bound by the new route to Rio, he carefully surveyed; the chart of the same has been published in the 5th edition of Maury's Wind and Current Charts. He then looked into the Amazon, and returned home, continuing his examinations for vigias, temperatures, and currents, to the windward of the West India Islands, but without being able to run a proposed zigzag line of deep-sea soundings to Cape Charles.

The subjects of observation which commanded the particular attention of the officers of the above vessels, according to the instructions of Lieut. Maury, were these:—1st. "The force and direction of the wind, the hourly state of the weather, and all the meteorological conditions connected therewith—as thermal, dynamical, barometrical, and the like. 2d. The force and set of the currents, their depth and width, their temperature, and the position of their edges, or limits. 3d. Hourly observations upon the temperature of the surface water. 4th. Frequent observations upon the temperature of the ocean, at various depths. 5th. Deep-sea soundings. 6th. Vigias, and all dangers about which there are doubts, either as to existence or position. 7th. Transparency and saltness, or the specific gravity of sea-water, in the different parts of the ocean." The soundings were to be at intervals of 30 miles.

The Dolphin was absent upon this duty for eight months, when she returned, and on being made ready to continue this service, she was placed under the command of Lieut. O. H. Berryman, and put to sea, September, 1852, from New-York. His instructions required him to "examine for vigias, and make a series of highly important observations in that part of the ocean, through which the routes to Europe run." He was, however, overtaken by a severe gale of wind, and obliged to go into Lisbon for repairs. Thence he returned to Norfolk by the southern route. Notwithstanding these misfortunes, many valuable and interesting results have inured to commerce and

navigation from this cruise. The brig having been repaired, sailed from Norfolk in May, 1853, to complete the examination of the northern route to Europe.

"During this cruise, a line of deep-sea soundings was run entirely across the Atlantic, from the shores of the United States to Rockall, off Ireland, and thence to Fayal; thence down to Cape de Verde Islands; thence by a zigzag course, crossing and recrossing the parallel of 25° S., to the neighborhood of the West Indies, and so home again, passing to the windward of those islands. This zigzag line of soundings, with those made by Lee, of the Dolphin, Rogers Taylor, of the Albany, Capt. Platt, in the Gulf of Mexico, enables us, for the first time, to present, with any considerable degree of satisfaction, a vertical section, or profile view of the bottom of the Atlantic, from one side to the other.

"Already have these explorations enabled the hydrographer to clear his chart of many false dangers. Upon the faith of Lieut. Walsh's work, there has been erased from the charts no less than seven imaginary hindrances to navigation, as follows:—

"*Ashton Rock*, lat. 33° 49′ N., lon. 71° 41′ W., said to have been discovered by Capt. Guy in 1824. Lieut. Walsh searched for it six days, sounding with from 100 to 800 fathoms line, no bottom.

"*False Bermuda*, lat. 32° 30′ N., lon. 58° 40′ W. Name of discoverer not given. It was searched for eight days, sounding the while from 100 to 800 fathoms line, and no bottom.

"*Nye's Shoal*, lat. 31° 15′ N., lon. 55° 50′, W., said to have been seen in 1826, by Capt. Nye. The Taney cruised about this place for eight days, also sounding as above, without any traces of the shoal or bottom.

"*Vankeulen's Vigia*, lat. 31° 40′ N., lon. 38° 20′ W., quoted in the charts, but upon what authority does not appear. Lieut. Walsh reports a thorough but fruitless search for it.

"*Josyna Rock*, lat. 31° 40′ N., lon. 23° 45′ W., first seen in 1697, and again in 1805. This place was searched over with from 100 to 800 fathoms line out, without finding either bottom or rock."

"So also were *Steen Ground*, lat. 32° 30′ N., lon. 21° 15′ W., and *Mary's Rock*, lat. 19° 45′ N., lon. 20° 44′ W., both quoted in the charts, and the places of both given, although search was made without finding traces of either."

"Not one of them was found, says Lieut. Walsh, nor any indication of their existence; on the contrary, every evidence to disprove it. Our various tracks, over and about their reported positions, covering the extent of 1½ degrees of longitude, and 40 miles of latitude, with the many and deep soundings, from 100 to 800 fathoms, without getting bottom, will be sufficient, I trust, to satisfy navigators that they have no existence, or, at least, that those parts of the ocean in which they have been reported to exist, are free from all danger.

"All our tracks were by daylight, as the schooner was always hove to at night, while engaged in these explorations. A slight discoloration of water was noticed in the region assigned to Mary's Rock, but no soundings could be got with 500 fathoms This rock had been likewise searched for, with like results, by the United States exploring expedition, Capt. Wilkes, and by H. M. ship Levin, Capt. Bartholomew. Ashton Rock is placed in a most frequented part of the ocean; there is not a day that some vessel does not pass in the vicinity, and nothing has been seen of it since the first and only report of it, in the year 1824. I also find Mr. Blunt has erased it from his chart of the North Atlantic, as also the False Bermudas, Vankeulen's Vigia, Steen Ground, and Mary's Rock. There are sufficient real dangers in the Atlantic; these imaginary ones should not disfigure the charts; they only serve to harass navigators, turn vessels from their routes, and thus injure commerce. The reports of them, by merchant vessels, which seldom take time to examine the appearance of such dangers, can be readily explained. Floating wrecks, large trees, carcases of whales, &c., presenting all the appearance of reefs, have deceived experienced seamen."

Lieut. Lee, commanding the Dolphin, reports searching for the following named vigias, without finding the least trace of any of them, viz.:

"*Potomac Sounding*, lat. 38° 10′ N., lon. 67° 26′ W., on the authority of Capt. Smith, of the ship Potomac. Lieut. Lee

sounded with 400 fathoms of line, but obtained no bottom. Lieut. Berryman, in 1853, made thorough search for this shoal, and got bottom at 2,750 fathoms.

"*Fields' Vigia*, lat. 37° 31′ N., lon. 66° W., reported by the master of the schooner Little Mary. Lieut. Lee made a good search for this vigia. Many soundings were made, one near it of 1,175 fathoms, and one over its position of 500 fathoms, without finding bottom.

"*Amfitrite Breakers*, lat. 35° 40′ N., lon. 65° 58′ W., reported to exist, by the master of a Spanish merchant ship, the Amfitrite, in 1846. Five days were occupied by Lieut. Lee, in searching for them; he passed over their position, Oct. 25, 1851, sounding with 1,000 fathoms, and no bottom.

"*Dyet's Rock*, lat. 32° 46′ N., lon. 60° 6′ W., reported as having been seen in 1845, by Robert Dyet, master of the English barque Catharine Green. Seven days were employed by Lieut. Lee in an unsuccessful search for this rock. Soundings were made at 550 over, and 800 fathoms near its position, without obtaining bottom.

"*Vigia of* 1827, lat. 31° 17′ N., lon. 53° 22′ W. The authority for this Vigia is the Admiralty Chart of June, 1851. No appearance of danger was seen by Lieut. Lee. Soundings were made, but no bottom obtained with 500 fathoms line.

"*False Bermudas*, lat. 32° 30′ N., lon. 58° 50′ W. The authority for this danger is 'one Louis Duhal, in a corsair,' and Francis Keeling, of a post-office packet, in 1810. Several days were employed by Lieut. Lee in searching for this danger. Soundings were made with 350 fathoms of line, and no bottom obtained.

"*Gandarias's Rocks*, lat. 25° 30′ N., lon. 37° 45′ W., reported in 1842, by Capt. Gandarias, of the Spanish merchant ship Dolores Ygarte. Lieut. Lee cruised about their position for four days, without finding any traces of their existence. Soundings were frequently made, and bottom was probably obtained at 1,720 fathoms.

"*Gomband's Rock*, lat. 23° 15′ N., lon. 32° 25′ W., reported by Gomband in 1764. Search and soundings were made for it during two days; bottom was obtained at 2,200 fathoms.

"*Emily's Rock and Shoal,* lat. 16° 59′ N., lon. 21° 30′ W. This rock and shoal rest upon the authority of the master of the brig Emily, of London. Lieut. Lee saw no indications of their existence, and he obtained bottom at 1,580 fathoms, near the alleged place of their existence, over which a line of soundings had been run.

"*French Shoal,* lat. 4° 15′ N., lon. 19 20′ W., reported by French East India ships, in 1796. It was unsuccessfully searched for in 1838, by the United States Exploring Expedition. Lieut. Lee obtained bottom over their reported place, with 2,550 fathoms of line.

"*Krusenstern's Volcano,* lat. 2° 31′ S., lon. 20° 44′ W. Admiral Krusenstern, 1806. Soundings made, and no bottom reached with 3,550 fathoms of line, by Lieut. Lee, in its immediate location. A fruitless search was also made for it by the Exploring Expedition in 1838.

"*Triton's Shoal,* lat. 0° 32′ S., lon. 17° 46′ W., reported by Capt. Proudfoot, of the ship Triton, 1816. Lieut. Lee obtained bottom, over its alleged position, at a depth of 2,840 fathoms.

"*Bouvet's Sandy Island,* lat. 0° 23′ S., lon. 19° 10′ W., reported by Capt. Bouvet, in 1761. After a careful search and sounding with 1,500 fathoms of line, without reaching bottom, Lieut. Lee could discover no appearance of shoals or dangers.

"*Aquilla Reef,* 0° 22′ S., lon. 21° 6′ W., reported by Capt. John Taylor in 1831. Lieut. Lee sounded over its position with 1,960 fathoms; no indications of dangers were seen thereabouts.

"*Le Pacifique Shoal,* lat. 0° 42′ S., lon. 22° 47′ W., reported by Capt. Bofils, of the French frigate Pacifique. Lieut. Lee saw no appearance of danger, nor experienced any shock; no bottom was obtained near its position, with 2,125 fathoms.

"*Crown Reef,* lat. 0° 57′ S., lon. 23° 19′ W. Barque Crown, of Liverpool. When near its alleged position, Lieut. Lee sounded with 1,500 fathoms line, and when on it, with 1,100 fathoms, without finding bottom by either attempt. He saw no indications of a reef in this vicinity.

"*Vigia south of Fernando Noronha,* lat. 4° 43′ S., lon. 32° 43′ W., laid down in the Admiralty Chart of 1836. Lieut. Lee

sounded from a boat, on the position assigned this vigia, with 1,250 fathoms of line, without getting bottom.

"*Blaesdale's Coral Reef*, lat. 0° 57′ N., lon. 41° 6′ W. By Capt. Blaesdale, in 1819. Four days were occupied by Lieut. Lee in searching for this reef; soundings at regular and brief intervals were made, and bottom obtained, over its position, at a depth of 2,980 fathoms.

"*Voette's Bank*, lat. 15° N., lon. 49° W., on the authority of Joachim Voette, date not given. Lieut. Lee made a good search for this bank, sounding over its assigned position with 250 fathoms, without finding bottom.

"*Galleon's Bank*, lat. 15° 56′ N., lon. 49° 40′ W. By the pilots of Spanish Galleons, in 1730. Lieut. Lee sounded over its alleged position, with 560 fathoms, and he made three similar soundings near it, without finding bottom.

"*Martin's Reef*, lat. 16° 42′ N., lon. 58° 53′ W. First discovered in 1742, and seen in 1816, 1823, and 1842, in different positions. Two days were spent in searching for this bank, many soundings were made, one of 3,200 fathoms, without finding bottom. No indications of dangers were seen in its alleged vicinity.

"*Mourand's Bank*, lat. 24° 34′ N., lon. 65° 10′ W., on the authority of Mourand, in 1773. Lieut. Lee searched for this bank five days. Soundings were often made over its assigned position; no bottom was had at 1,000 fathoms; no indications of danger were seen after a most thorough search."

Shoals, Rocks, Vigias, &c., searched for by U. S. brig Dolphin, (Lieut. commanding O. H. Berryman,) in 1852 *and* 1853.

"*Daraith's Rock*, lat. 40° 50′ N., lon. 54° 53′ W., reported by M. Daraith, in 1700. Lieut. Berryman obtained bottom over its alleged place, at a depth of 2,710 fathoms.

"*Watson's Rock*, lat. 40° 18′ N., lon. 53° 40′ W., on the authority of Capt. Watson, in 1824. Lieut. Berryman searched for, and sounded over its position, finding no bottom at 500 fathoms.

"*Hervegault's Breakers*, lat. 41° 2′ N., lon. 49° 23′ W., reported on the authority of M. Hervegault, in 1723.

Berryman made a thorough search for them in 1852 and 1853; he obtained bottom over their assigned position, at a depth of 4,580 fathoms.

"*Breton Rock*, lat. 39° 40′ N., lon. 41° 35′ W., on the authority of Breton, a pilot of Rochelle, and seen again in 1816. No indications of a rock was seen by Lieut. Berryman; he obtained bottom over their assigned position, at a depth of 2,500 fathoms.

"*Druid's Rock*, lat. 41° 19′ N., lon. 41° 25′ W., reported in 1831, by Capt. Treadwell, of the Druid. Lieut. Berryman could see no indication of a rock, nor find bottom with 500 fathoms over its alleged position.

"*Gouch's and Birch's Rock*, lat. 40° 28′ N., lon. 30° W., quoted in the charts, upon the authority of Captains Gouch and Birch, in 1778; seen again in 1820 and 1830. After a thorough search, Lieut. Berryman could find no evidence of its existence; no bottom, with 1,000 fathoms, could be found over its assigned place.

"*Three Chimneys*, lat. 47° 54′ N., lon. 29° 40′ W. This vigia rests upon the authority of Capt. Fernel, 1729; reported as seen again in 1824 and 1843. Lieut. Berryman made a close search for this danger; he obtained bottom over its assigned position, at a depth of 1,900 fathoms.

"*Mariners' Rock*, lat. 46° N., lon. 29° 37′ W., on the authority of Mr. Swinton, master of the ship Mariner, in 1831. Lieut. Berryman obtained sounding over its position, at a depth of 1,760 fathoms; he saw no indications of a rock.

"*Devil's Rock*, lat. 46° 35′ N., lon. 13° 7′ W. This rock 110 leagues W.S.W. of Ushant, was said to exist by Capt. Brignon, in 1737; afterwards seen in 1764, in 1818, and twice in 1829. Lieut. Berryman saw nothing of it, after a careful search; he found bottom at 2,200 fathoms, over its assigned position.

"*Jean Hammon's Rock*, lat. 36° 54′ N., lon. 19° 49′ W., named after its discoverer, Capt. Hammon, who saw it in 1733; not seen since. Lieut. Berryman could find no bottom over its position, with 2,100 fathoms line.

"*Vigia of* 1851, lat 45° 19′ N., lon. 38° 36′ W. No authority

is given for this vigia. Lieut. Berryman searched for it, and sounded, without obtaining bottom, at 200 fathoms.

"*Eight Stones*, between lat. 34° 30′ and 34° 45′ N., lon. 16° 40′ W., said to have been discovered in 1761, by Capt. Vobonne. Lieut. Berryman made a thorough search for them; he sounded at regular and short intervals, obtaining bottom at 2,298 fathoms. He saw no indications of their existence.

"The above positions, says Lieut. Berryman, were all reached at a period of the day, when our latitude and longitude were accurately obtained by good observations, and soundings were taken with the line for deep-sea soundings, and no indications whatever were observed of any of them, nor of shoal water. A good look-out was kept night and day, on the foretopsail yard, about seventy feet above the level of the sea."

Concerning the manner of obtaining deep-sea soundings, we will give Lieut. Maury's directions in a future number.

MAINE CARRIES THE BROOM.

EXTRAORDINARY SAILING.

THE clipper ship Flying Scud, Capt. Bearse, of R. W. Cameron's Pioneer Line of Australian Packets, from New-York, Sept. 29, for Melbourne, on the 6th of November, run 449 nautical miles in 24 hours. On the 24th of November, the ship was in latitude 45° 47′ S., longitude 32° 6′ E., and arrived Dec. 10, in longitude 139° E., running 6,420 nautical miles in 16 consecutive days, averaging 401 nautical miles per day. She crossed the Equator, 26th of October, longitude 32° 41′ W., and arrived at Melbourne, Dec. 18, after a passage of 75 days, being the best passage ever made from New-York. The Flying Scud was built by Messrs. Metcalf & Norris, at Damariscotta, Me. We shall give particulars in our next

ABSTRACT OF LOG OF SHIP GREAT REPUBLIC,

FROM NEW-YORK TO LONDON.

Date.	Lat.	Lon.	Dist.	Dist.	Days.	First Pt.	Middle.	Latter.	Course.
Feb.25	40.06	68.48	232	—	1	W.N.W	N.W.	W.N.W	E.½S.
26	41.06	64.09	210	442	2	W.N.W	N.W.	N.W.	E.byN.
27	42.23	60.08	194	636	3	N.N.W.	N.	N. by E	E.N.E.
28	43.11	54.33	254	890	4	N.E.	E.	N.W.	E.byN.
Mar. 1	45.23	48.26	296	1,186	5	N.N.W.	N.	N.W.	E.N.E.
2	48.29	43.09	287	1,473	6	N.W.	W.N.W	W.	N.E.byE.
3	50.36	36.40	287	1,760	7	W. by N	N.W.	W.N.W	N.E.byE.
4	50.58	29.47	265	2,025	8	N.W.	N.	N.N.W	E.½N.
5	52.12	26.21	150	2,175	9	N.	E.	S.E.	E.N.E.
6	52.35	22.51	130	2,305	10	S.E.	S.E.E.	S.	E.byN.
7	50.38	15.06	342	2,647	11	W.	N.W.	N.W.	E.S.E.
8	50.11	12.19	141	2,788	12	N.W.	N.	N.N.E.	E.½S.
9	49.54	9.23	135	2,923	13	S.E.	S.W.	W.	E.½S.
10	50.03	3.42	223	3,146	14	W.	N.	N.N.E.	E.½N.
11	50.27	1.28	95	3,241	15	N.E.	Calm.	Calm.	E.by S.

On the 12th anchored in the Downs at 3 P. M., having sailed 3,241 miles. We had no observation of the sun for a latitude until March 8. We made the land 12 days from New-York. The passage has been a rough one indeed. We made 342 miles in 22 hours, and then had to bring the ship to, on account of thick weather and proximity to land. The ship behaves nobly, and can easily make 400 miles in 24 hours. We were 13 days to Scilly, since that time light winds and calms. We laid by all of the day Sunday, 11th inst., about 12 miles from Isle of Wight; weather thick and foggy. The ship is tight and strong, and the best ship at sea I was ever in.

You would hardly know that you were at sea in a heavy sea; she moves along easily, making no fuss, in fact, splendidly, and steers like a boat in a pond; a boy can steer her easily.

Capt. J. LIMEBURNER.

The Great Republic, which arrived at Gravesend 15th, would probably lie off Bosherville for some days, waiting the spring tides, when she would go higher up the river and discharge into lighters, as none of the entrances of the docks are wide enough to admit her.

A QUICK TRIP.—Steamship United States, which arrived at New-York on the 8th instant, from Havana, made the quickest trip on record from the latter port. She was only three days and twenty-three hours from Havana to Sandy Hook.

APPROVED INVENTIONS FOR ECONOMIZING LABOR ON BOARD OF SHIPS,

AND FOR SECURING LIFE AND PROPERTY.

Our attention has been called to the following, among many of the modern inventions and improvements for economizing labor in the management of vessels, and for securing life and property on ship-board. Within the past ten years great progress has been made in the fitting and working of ships, which has vastly contributed to their durability, economy and comfort. The adoption of a thousand happy contrivances, which were looked upon at first as of no value, if not actually dangerous, has rendered the life of the mariner a most beneficent service, and contributed to elevate his profession above a system of drudgery and slavish toil, by substituting ingenuity for strength, and intelligence for mere animal instinct. The human mind cannot but dwell with pride and satisfaction upon a result of such importance, and look forward with hope to the time when prejudice and avarice shall have melted away, and the open field of improvement shall invite the attention of every commercial man to the various inventions of the true benefactors of mankind.

Allyn's Patent Power Capstan—has been furnished to over 100 vessels the past year, many of which from the port of New-York, viz.:—Ships "Great Republic," "Ocean Herald," "Flying Cloud," "Harvey Birch," "Palestine," "Uterpe," "Chariot of Fame," "Morning Light," "Herald of the Morning," "Cœur de Lion," "Sunny South," Bark "Storm Bird." The Steamer "Metropolis," built by S. Sneden for Fall River Line, has three on her. The "Empire State," "Plymouth Rock," "Cuba," (built for the south) "Metta Comet," "Eagle's Wing," and many others, are furnished with them; the above being sufficient to prove their efficiency and popularity. The *power* being eight to one, by calculation, but, *experimentally*, ten to one; would refer to the above. The advantages of these capstans can be seen at a glance, particularly to the Liverpool and London trade. They are now being constructed to work chain cables, and take the place of the windlass. They are ordered for the new government steam frigate "Niagara."

Reed's Patent Improved Steering Apparatus—has been used on many of our first-class ships with perfect satisfaction, being considered preferable to any other now in use, as they work with such ease and rapidity; *gaining power* just the time *required*, and *not* liable to get out of order or require repairs. The ships "Kathay," "Phenix," "Palestine," "Uterpe," "Napier,"

"Rattler," "Zeguca," "Sunny South," "Mischief," "Great Republic," and fifty others from this port, are fitted with this apparatus.

Captain Limeburner, writing to Messrs. A. A. Low & Brothers, owners of ship "Great Republic," says: "She was so easy at the wheel, that a boy could steer with perfect ease." These wheels are ordered for the Havre steamers, and the government steam frigate "Niagara;" and the rudders to be supported by "GALLUP'S PATENT ROTARY HANGINGS," many of which are being used on the largest ships—on Collins' steamers, ships "John Bright," "Aurora," "Monarch of the Seas," "Titan," "Neptune," "Surprise," Havre steamers, &c.

CRANE'S PATENT CHAIN CABLE STOPPERS are too well known and appreciated to require any explanation, more than to say they have been applied to more than 1000 vessels, and is the oldest invention in this country for that purpose.

COALMAN'S METALLIC LEADING TRUCKS are neat, compact, durable, and much the cheapest in the end, saving a vast amount of time and spun yarn, and wear upon the rigging.

BARKER'S PATENT METALLIC JIB AND STAYSAIL HANKS are being generally used and approved; many thousands have already been used.

FRANCIS'S LIFE BOAT is too well known to require any particular notice.

EDSON'S PATENT PUMP, a new invention for ship use, is an ingenious machine, perfectly simple, and easily packed and kept in order.

TEWKSBURY'S PATENT MARINE LIFE PRESERVING SEAT is one of the most *available* life-preservers in case of emergency yet offered to the public, being always ready in the form of a seat, for either cabin or deck, and is very neat and compact; having been adopted by more than half of all the steamships and steamboats from this port, viz.: Savannah, New-Orleans, Virginia, Vanderbilt's and Philadelphia Steamship lines; all of the Sound steamboats, and many of the Bay and North River steamers; the Pacific Mail Steamship Company took 1000 at one order for their steamers; many thousand have been distributed at Boston, Baltimore, Washington, Charleston, Savannah, New-Orleans, Buffalo, and on the lakes. Steamship America has 200; Baltimore Mail Steamers to Norfolk took each 200; sailing ships also are using them.

The Maryland Mechanics' Institute, at Baltimore, recently awarded to Mr. Randlet a *Silver Medal* for these seats.

MARINE DISASTERS, AND LOSS OF LIFE AND PROPERTY ON THE LAKES, FOR 1854.

WE give below a statement of Marine Disasters during the past year, together with the loss of life and property consequent thereupon. It has been prepared by Capt. P. Dorr, Marine Inspector of the Buffalo Mutual Insurance Company, who has spared no pains or expense in obtaining the most accurate and reliable data. This statement shows an enormous increase in the amount of losses for 1854, as compared with previous years. Returns received from several points are not as full as could have been desired, but the list is believed to be as correct as it was possible to make it, though the aggregate loss, as appears by that table, is undoubtedly far below the actual amount.

The loss of life in	1854 was	119
In	1853	81
In	1852	296

which shows an increase as compared with 1853, though a large decrease as compared with 1852.

The loss of property for the past three years compares as follows :—

1852	$992,659
1853	874,143
1854	2,187,825

showing the enormous increase in 1854, as compared with 1853, of $1,313,682. The statement will be found valuable to those engaged in the commerce of the Lakes, as well as others, for present use and future reference.

Losses by Steamers,	$463,400
" Propellers,	680,100
Total losses by Steam vessels in 1854,	$1,143,500
Total loss by Sail in 1854, was	1,044,325
Total loss,	$2,187,825
Losses in January, Steam and Sail,	$ 10,000
" April, " "	310,750
" May, " "	217,000

Losses in June,	Steam and Sail,	....	40,700
" July,	" "	....	59,050
" August,	" "	....	66,625
" September,	" "	....	129,600
" October,	" "	....	408,100
" November,	" "	....	456,000
" December,	" "	....	490,000
Total,		....	$2,187,000

Amount of loss by Jettison,........................	$108,770
" " " Collision,........................	270,000
" " " Fire,............................	262,500
" " " Lightning,......................	1,900
Number of lives lost,..............................	119

The total number of disasters in 1853, was...........	266
" " " 1854, was...........	384
Increase,.....................	118

Of the three hundred and eighty-four disasters above detailed, one occurred in January, forty-six in April, twenty-five in May, eleven in June, fourteen in July, twenty-one in August, fifty-eight in September, sixty-one in October, eighty-three in November, and sixty-four in December. Total, 384. Eight steamers, six propellers, three barques, eight brigs and thirty schooners, have, according to the above list, gone out of existence during the past year.

This statement does not include all the casualties that have occurred on the Lakes during the past year. Those of minor importance, where the loss was under one hundred dollars, have been omitted, and it is more than probable that there may be some large losses, which have been overlooked; and from the fact that the estimates as given above are in the main very low, we are inclined to believe that the aggregate loss of property on the Lakes, for 1854, exceeds *two and a quarter millions* of dollars.—*Buffalo Democracy.*

NOTICES TO MARINERS.

A LARGE iron buoy has been placed on the Eastern part of Davis' Ledge, in five fathoms at low water. It is painted black, with a four armed signal of block tin. The words "Davis' Ledge" are painted on the round in large letters.

Per order of the Lighthouse Board.

BOSTON, April 7, 1855.

The Light Vessel stationed at Lower Cedar Point, on the Potomac River, having been thoroughly repaired and fitted with a new lighting apparatus, will resume her station on or about the 20th inst.

By order of the Lighthouse Board.

April 10, 1855.

THE POLLOCK RIP LIGHT BOAT.—Great complaint is made that this highly important light boat, which marks the channel among the dangerous shoals off the southeast shore of Cape Cod, should be so frequently and so long absent from her station. A great number of coasting vessels are continually passing among these dangerous shoals, amounting sometimes to a hundred and fifty in a single day; and it is a standing reproach upon our government that the light boat cannot be kept at her post. Many lives and much property are endangered by her frequent absence.—*Boston Daily Advertiser.*

A Fog Bell, weighing 1055 pounds, has been placed at the Saybrook Lighthouse, on the west side of the entrance to the Connecticut River. It will be rung by hand for the present, to answer to signals from vessels desirous of knowing their positions.

By order of the Lighthouse Board.

NEW-YORK, March 21, 1855.

The Fog Bell, weighing 1010 pounds, has been placed at the North Dumpling Lighthouse Station, west entrance to Fisher's Island Sound, N. Y. It will be rung by hand for the present, in answer to signals from vessels wishing to know their positions.

By order of the Lighthouse Board.

The Newburyport Herald states, that a can buoy was placed on Newburyport Bar 24th inst., in five fathoms. It can be distinctly seen three miles in clear weather. A Bug light has been recently placed on Plum Island. The Herald states, that the buoy is gone from the Gangway Rock, and trusts it will soon be replaced.

BUOY ON POLLOCK RIP BREAKER.—Lieut. A. A. Holcomb, Lighthouse Inspector, has recently caused to be placed a nun buoy on the Pollock Rip Breaker, off Chatham. It is painted black, with the number 5 on it, and stands in 20 feet of water. Bearings are as follows:—Chatham Lights, N.; Light Ships, ¼ W., distance ½ mile; Monomoy Light, W. by N. ½ N.

The Pollock Rip Light Boat slipped her moorings in the late gale, and went into the Powder Hole, Chatham.

Sar. schr. Sophia, from Melbourne, for Hong Kong, reports that on the 28th September, 1854, discovered a reef, on which was the remains of a wreck. This reef laid by observation in lat. 8° 6′ N., lon. 154° 18′ E. Greenwich Meridian. It had the form of an ellipsoid, and extended about seven miles from E. to W., and two miles N. to S. On the N. side the sea

broke the whole length, and on the S. at intervals. A portion of the eastern end was dry; the west under water. About half a mile from the eastern end, sounded, but found no bottom at 45 fathoms.

LIGHTHOUSE ON MOUNT IGUELDO, PROVINCE OF GUIPUSCOA.—A new light will be exhibited every night from sunset to sunrise on Mount Iguelde, port of San Sebastian, on and after the 15th day of March next. This new lighthouse will substitute the light kindled during the winter from the Castle of La Mota.

The new lighthouse is situated to the west of San Sebastian, in lat. 43° 19′ 28″ N., lon. 4° 11′ 50″ E. of the Meridian of the Observatory of San Francisco.

The apparatus is catadioptric, grand model of the 3d order, producing a fixed light of natural color, variegated by brilliant flashes every two minutes, and may be seen at a distance of fifteen miles and less, according to the state of the atmosphere.

The luminous focus is elevated 468 Castilian feet above the level of the sea.

MADRID, January 26, 1855.

MARTIN'S INDUSTRY LIGHT SHIP.—This vessel is now moored in 7 fathoms water, and will show her light from this date off the end of the above ship. Her hull is painted red; has two masts; will show one bright light elevated about 38 feet above the level of the sea, and may be seen in clear weather from the deck of an ordinary-sized vessel 8½ miles. She rides at a single mushroom anchor, with ninety fathoms of chain.

The following are the approximate bearings and distances, by compass, of remarkable points from the ship, viz.: Bay Point, N. N. W., distance 10 miles; Hilton Head, N. W. by N. 8½ miles; Tybee Light House, S. W. by W., nearly ¾ W., distance 15 miles; Outer Buoy of Savannah Bar, S. W. by W., about 12 ½ miles distant.

N. L. COSTE,
Captain Revenue Cutter Jackson.

March 15, 1855.

CORAL REEF IN THE STRAITS OF LOMBOCK.—We take the following report from the Hong Kong Government Gazette of December 9th:

Government Notification.—The following particulars connected with the discovery of a coral reef in the Straits of Lombock, have been received through the Harbor Master, from the master of the ship Argonaut, and are now published for general information.

"Tuesday, October 1st, at 2 30 P. M., entered the Straits of Lombock, between Banditti Island and Lombock. Finding that Horsburgh's chart was very incorrect, endeavored to keep in mid-channel, which at the entrance is not more than a mile wide.

"At 7 P. M., very moderate, ship going three-quarters of a knot, grounded on a reef of coral and stuck fast. When we struck we were heading N. E. by N., north point of Lombock N. E. half E., south point S. S. W., Banditti Island West, and Peak of Bally, N. by W.

"In approaching the reef the water shoals from no bottom in 72 fathoms, to next cast 23, and then to 7, and before we could get another cast the ship was ashore. By order,

W. T. MERCER, Colonial Secretary.

Colonial Secretary's Office, Victoria,
Hong Kong, 4th Dec., 1854.

DISASTERS AT SEA.

STEAMERS.

Charles Osgood, (propeller,) New-York for Norwich, took fire in Long Island Sound
United States, got aground in harbor of Havana, off next morning.

SHIPS.

John Rutledge, New-York for Liverpool, lost sails, &c., March 10.
Unknown, was seen ashore, March 14, near India River Inlet.
Huron, at Boston for New-Orleans, lost sails, bulwarks, &c., March 10.
Unknown vessel was seen, March 14, Lat. 31°, Lon. 70°, water-logged and abandoned.
Agnes, at New-York from Rio Janeiro, lost spars, &c.
Rebecca, at New-York from New-Orleans, shifted cargo, &c.
Two unknown vessels seen ashore on north end of Pulo Seat, (Casper Straits.)
A clipper was seen ashore on the north end of Billeton.
Sacusa, at New-York from Newport, Wales, lost boats, sails, bulwarks, &c.
States Rights, Philadelphia for Liverpool, leaking badly, and was abandoned, March 15.
Unknown (large) was seen ashore on Matanilla Reef, 10 miles north of Memory Rock.
Daylight, at New-York from New-Orleans, shifted cargo, &c.
Dirge, at New-York from Glasgow, lost rail, bulwarks, &c.
William, New-Orleans for Philadelphia, went ashore on the Hen and Chickens.
James Cheston, of Baltimore, abandoned at sea, had not been in a storm, but had auger holes bored in her.
Cairo, at San Francisco from New-York, lost sails, &c.
Walter Lord, (new) was seen, March 21, with loss of sails, boats, &c.
Colloney, at Cowes from New-Orleans, lost bulwarks, and part of cargo.
Elise, at Cowes from New-York, lost sails, rigging, spars, &c.
Unknown vessel, was passed, Feb. 23, full of water, all masts gone, and crew aboard.
Star of the West, at Liverpool from New-York, lost spars, sails, and ship leaking badly.
New-York, at Liverpool from New-York, had decks swept, and lost spars.
Bille Brahe, Sweaborg for Boston, abandoned on the passage.
Try, at Liverpool from New-Orleans, lost a boat.
Manhattan, at Liverpool from New-York, damaged in a gale.
Helen, Savannah for Liverpool, lost rudder, and leaking, was abandoned.
Eva, New-Orleans for Trieste, got ashore, March 25, near Riding Rocks.
John C. Calhoun, New-Orleans for Havre, wrecked on Matanilla Reef, Flo.
American, at New-Orleans, struck on a sand bank near Pass-A-l'Outre, leaking, &c.
Flora McDonald, at Baltimore from Liverpool, lost bulwarks, rails, &c.
St. Patrick, Liverpool for New-Orleans, was ashore on Pass l'Outre, March 19.
Troy, (new,) for New-Orleans, returned to Boston, lost bowsprit, topmast, sails, &c.
Unknown, (clipper,) was passed March 28, dismasted.
California Packet, was in contact with a vessel in Hampton Roads, and much injured.
Lady Franklin, for Falmouth, England, put in St. Georges, Bermuda, March 4th.
St. Bernard. New-York for New-Orleans, totally lost March 23, on Berry Island, Bahamas.
James Chester, of Baltimore, taken into Liverpool, derelict.
Rockland, New-York for San Francisco, put into Valparaiso to repair damages.
Unknown, was passed in the Gulf dismasted, carrying a blue light.
John Albert, at Savannah from Liverpool, damaged in rigging, &c.
Hudson, New-York for New-Orleans, was totally lost on Elbow Key, Florida, March 14.
Oneco, Savannah for Liverpool, put into Boston, leaking 1,200 strokes per hour.
Sandusky, at New-Orleans from Liverpool, went ashore on Moselle Shoals, March 12.
Peter Hatterick, at Antwerp, had thrown over part of cargo.
Rasteed, at Bremerhaven from New-York, got aground in going in the harbor of Bremerhaven.
J. W. Fannin, at Galveston from New-York, lost bulwarks, &c.
William Laytin, New-York for Antwerp, was lost February 22.
Golden Mirror, New-York for Toulon, was abandoned March 9th, with 9 feet 6 inches water in hold.
Jersey, at New-Orleans from Liverpool, lost mainyard, sails, &c.
Rotunda, at Charleston from Liverpool, damaged spars, sails, &c.
Meta, New-York for Bremen, put into Fayal with rudder damaged.
Bombay, at New-York from Calcutta, lost bulwark, sails, and stove boats.
Witch, from St. Johns, N. B., was passed March 3, dismasted, water-logged and abandoned.
Water Lord, at New-Orleans from Bath, lost a number of spars.
Keystone, for San Francisco, lost spars, and was making for St. Thomas.
Talleyrand, for Liverpool, put into Cadiz in distress, leaking badly.
Tartar, New-York for Melbourne, put into Cadiz leaking, and had rudder damaged, &c.
Northampton, at Valencia, in distress, from New-York, lost sails, bulwarks, &c.

BARQUES.

W. H. D. C. Wright, Baltimore for Rio Janeiro, was run into during a fog.
Deney, at New-York from Neuvitas, March 10, lost part of deck load.
Mary Chipman, at New-York from Key West, March 9, lost boat, sails, &c.

Geo. D. Smouse, at New-York from Port-au-Prince, stove the galley, boat-house, &c.
Georgia, at New-York from New-Orleans, had decks swept, shifted cargo, lost sails, &c.
Genessee, from New-Orleans, leaking 2,500 strokes, threw overboard sugar, cotton, rags, &c.
Roanoke, from Mayaguez, P. R., damaged sails and rigging.
Oliver J. Hayes, at New-York from Buenos Ayres, lost some spars and sails.
C. B. Hamilton, at Portland from Cardenas, lost sails, stove some hhds. molasses, &c.
Restless, New-York for Santa Martha, returned with loss of bulwarks, galley, and deck load.
Larrabee, at Boston from Cardenas, had been ashore on George's Island.
Magnolia, New-York for Mobile got aground on Loo Key, March 21.
Griffin, at New-York from Apalachicola, lost sails, sprung spars, &c.
M. E. Trout, at New-York from Frontera, Tobasco, lost sails, &c.
N. Boynton, at New-York from New-Orleans, lost sails, sprung spars, &c.
Three Brothers, at San Francisco from Batavia, lost sails, bulwarks, rail, &c.
Flight, at Savannah from New-York, damaged in spars and rigging, and run into by a schooner.
Delawarean, at Baltimore from Rio Janeiro, sprung aleak, and also got aground.
Richmond, at Portland from Trinidad, lost part of deck load, &c.
A. G. Hill, at St. Thomas from New-Orleans, sprung mainmast and twisted rudder.
Creole, Londonderry for Philadelphia, was passed near Cape Henlopen, apparently aground.
May, for one of the Carribean Keys, was totally lost in the Carribean Sea.
Bay State, Baltimore for Boston, ashore on the Nine-Foot Knoll, March 22.
St. Jago, at Newport in distress, lost the capstan, foremast, &c., in a gale.
Maria Morton, at Boston from Savannah, lost quarter boat, bulwarks, &c.
Kate, at Baltimore from Laguayra, lost spars, &c.
Saranac, at Wilmington, N. C., from Cardenas, cast over deck load off Cape Romain.
George Allen, at Charleston, in distress, for Vermont, had sprung aleak, and lost part of cargo.
Attica, at New-York for Hamburg, April 8, shifted cargo, lost sails, &c.
Glen, for Boston, was spoken, had lost deck load, and leaking.
Roderick Dhu, for Oporto, put into Hamilton, Bermuda, and will be condemned.
Samuel Merritt, at San Francisco from Philadelphia, leaking, cast over 100 tons coal.
Laura, at New-York from Trinidad, lost sails, bulwarks, &c.
Nashua, for New-York, at Bermuda, leaking.
Sarah Ann, at New-York from Attakapas, stove deck load, lost sails, &c.
Lowell, New-Orleans, at Baltimore, April 9, dismasted.
Rodman, was seen making for St. Thomas, with loss of some spars, and most of sails.
Mary Elizabeth, at Boston from Savannah, lost some bales of cotton.
Vickery, New-York for West Coast of Africa, put into Pernambuco in distress, February 9.
Odd Fellow, Havana for Portland, had sprung mainmast and lost main-topgallant mast.
Mary H. Chappell, at Providence from Mobile, lost some spars, and threw over 25,000 feet of lumber.

BRIGS.

Bloomer, New-York for Montevideo, has been totally lost.
Zenobia, Savannah for Boston, lost bulwarks, sails, cabin, &c.
Plumas, at New-York from Barrel Stake, Lou., lost sails, deck load of molasses, &c.
Zeno, at New-York from New-Orleans, March 9, lost boat and part of deck load.
Celt, at New-York from Attakapas, lost sails, part of deck load of molasses, &c.
Unknown (Herm.,) was passed, water-logged and abandoned, Lat. 36° 4', Lon. 71° 56'.
Shibboleth, Philadelphia for Boston, was abandoned at sea, Lat. 36° 30', Lon. 72°.
J. H. Long, Philadelphia for Charleston, was abandoned, March 12, in a sinking condition.
Albatross, Matanzas for New-York, put into Norfolk, lost spars, sails, boat, &c.
E. O. Holt, Port-au-Prince for Boston, put into Wilmington, N. C., in distress.
A. B. Van Olinda, Surinam for New-York, put into Bermuda, March 16, in distress.
Rechabite, Eastport for Philadelphia, lost anchor, some chain, and deck load of pickets.
Santiago, at Boston from Jamaica, lost bulwarks and deck load of logwood.
Westport, Boothbay for Georgetown, S. C., put into Norfolk, in distress, March 19.
Sarah W. Cushing, from Cardenas, put into St. George, Bermuda, March 4, leaking.
Ciudad Polivar, at New-York from Bordeaux, lost sails, &c., March 25.
Winthrop, at New-York from Palermo, lost sails, head-rail, &c.
R. S. Lamson, New-York for Jacksonville, put into Charleston, March 21, with pumps choked.
Tybee, at Charleston from New-York, stove boat, had 3 feet water in cabin and 2½ in hold.
Sea Bird, Trinidad for New-York, cut away masts, March 10, afterwards abandoned her.
Radius, Norfolk for Portland, went ashore at Green Island, off Cape Elizabeth.
Elias Dudley, at Bristol from Cardenas, lost sails, part of deck load, and leaking.
Catharine & Mary, New-York for Curacoa, abandoned at sea in a sinking state.
Viater, at Boston from Sagua, lost stern boat, sprung aleak, &c.
Harp, for Jefferson, got ashore at Tortugas, March 28.
Edward Lind, New-York for Guayama, in contact with a schooner, and returned to repair.
Hibernia, at Charleston for Portland, sprung spars, and leaking badly.
Sea Belle, at Charleston for New-York, had been ashore on Campeachy Bank.
Ransom, was fallen in with, March 27, dismasted, no assistance wanted.
Unknown wreck was passed, Feb. 17, water-logged and abandoned.
Sarah Vose, of Boston, was totally lost on Berry Islands, Feb. 22.
Benicia, from Darien, was abandoned at sea, crew saved.
Unknown vessel, about 300 tons, was seen dismasted, water-logged, and abandoned.
Lucy H. Chase, at Philadelphia from Mobile, leaking, and lost deck load, March 10.
Albion, for Havana, totally lost on a reef near St. Felip's Cayes, March 11.

Crimea, at New-York from Trinidad, had been ashore, February 26, on Jardine's Shoals, near Isle of Pines.
Beronda, at Boston from Matanzas, lost some spars, sails, &c.
Caroline, at Boston from Remedios, got ashore on Governor's Island, March 19.
Unknown, (probably Emma,) was spoken in distress, at night, and next day had disappeared.
Orison, at Boston for Cardenas, lost part of deck load.
William Purrington, for Bath, put into Holmes' Hole, leaky, lost sails, &c.
Cyrus, at San Francisco, lost both boats, bulwarks, and leaking badly.
Unknown, was passed, March 28, dismasted, water-logged, and abandoned.
Andover, for Key West, at Charleston, lost boat, sails, &c., and leaking badly.
Matanzas, at Philadelphia from Mobile, lost part of deck load, &c.
Orozimbo, for Boston, put into Edgartown, March 19, had lost boats, &c.
Rechabite, for Philadelphia, was spoken, had lost deck load.
Montague, for New-York, was spoken, had lost deck load of molasses, March 25.
Ocean Bird, at New-York from St. Jago de Cuba, lost water-casks, rail, &c.
Harriet Newell, at New-York from Cardenas, March 31, lost galley, &c.
Duncan, Philadelphia for Bath, April 2, foundered in a gale, all on board lost.
Dr. Rogers, at Salem from Surinam, lost sails, and leaking.
W. B. Nash, for New-York at Charleston, lost some spars, &c.
B. Strauts, Canary Islands for Boston, put into Liverpool N. S., in distress.
Adams Gray, Havana for New-Orleans, ran ashore near Pass l'Outre.
Julia, at Boston from Pernambuco, had decks swept, lost sails, &c.
Vincennes, Cardenas for Portland, was spoken, with loss of sails and deck load of molasses.
Ormus, at New Bedford from Philadelphia, struck on a sunken wreck near Tinicum Island.
Florence, at New-York, for Darien, Geo., was fallen in with April 2, dismasted.
Boston, Surinam for Salem, went ashore on S. W. point of Nantucket, April 11.
Unknown vessel, was seen, April 5, Lat. 43 10, Lon. 55, dismasted.
Henry H. Chappell, at anchor at Providence, was run into by a sloop, and lost bowsprit, &c
Venus, at Boston from Sagua, April 2, lost sails, and deck load.
Suwanee, New-York for St. Mark's, got ashore on the East Bank, April 6.
Francis P. Beck, drifted ashore on Coaster's Beach, Newport, R. I., and lost an anchor
Melita, Boston for Genoa, put into Fayal, March 19, with loss of topmasts.
John Alfred, Attakapas at New-York, in distress, leaking badly.

SCHOONERS.

Arcade, for New-York, put into Norfolk, March 17, lost spars, boats, sails, and leaking.
Nile, at Norfolk, with loss of anchor and sails.
Fanny Crocker, Dighton for Baltimore, put into Norfolk in distress.
Mary H. Case, Eastport for New-York, went ashore near Fire Island Light.
Flying Cloud, at New-York from Cardenas, lost bulwarks, &c.
Albert, at New-York from Jacksonville, E. F., lost boat, sails, and part of deck load.
Sophronia, at New-York from Tobasco, lost deck load, sails, &c.
Granite State, at New-York from Alvarado, lost some spars, &c.
West Wind, at New-York from Porto Cabello, lost some spars and sails.
Francis, of Freeport, was spoken, March 9, with bulwarks gone.
Unknown, was passed, March 17, Lat. 37.40, Lon. 74.10, masts both gone.
Benj. Franklin, Bath for Potomac River, ran into Norfolk, March 19, lost boat, &c.
Main, was burnt to the water's edge, March 17, at Madison, Conn.
Henry Atkins, Cardenas for Frankfort, lost sails, spars, deck load, &c., put into Portland.
J. E. Bowley, Norfolk for Boston, got ashore on Dennis' Flats and bilged.
G. M. Robertson, at New-York from Franklin, Lou., sprung aleak, lost sails, &c.
F. S. Solliday, at Baltimore from Attakapas, lost sails, deck-load, &c.
Louisa & Margaret, at Baltimore from Antigua, lost bulwarks, &c.
Julia A. Rich, at Baltimore from Attakapas, lost deck load, sails, &c.
Minerva, went ashore at Newcastle, Me., March 12th.
A. C. Howard, at Philadelphia from Attakapas, lost bulwarks, and cast deck load overboard.
Palestine, Aux Cayes for Boston, lost bulwarks, deck load, &c.
Neptune, at New-York from Attakapas, lost deck load, &c.
Black Squall, off New-York, in contact with schr. Golden West in a gale.
Carthagena, Portland for Cuba, put back, March 1, leaky.
Martha Russell, at Baltimore for Attakapas, stove part of deck load.
Island City, at Baltimore from New-York, injured and lost spars.
Fannie Mitchell, dragged anchors, and went ashore in Richmond Island Harbor.
Emma Amelia, Boston for Fredericksburg, ashore on Shovelfull Shoal, March 28.
Ganges, Providence for New-York, ashore on Bullock's Point, March 30.
Trader, St. Mary's for New-York, was run into and sunk by steamer Jas. Adger
J. R. Curdy, was run into in lower bay and sunk, all hands lost.
Tioga, at Boston from Manzanilla, lost deck load, and got ashore on Long Island, April 3
Leonora, Boston for Deer Island, dismasted off Cape Ann, March 24.
Alabama, at Savannah from Baltimore, lost some sails, &c.
Dolphin, (sloop.) went ashore at New Inlet, L. I., April 1, captain and one man lost.
Teazer, for New-York, at anchor near Montauk Point, filled, and all hands lost.
Unknown, anchored near Montauk Point, L. I., with loss of bowsprit, &c.
Thomas W. Olcott, ashore high and dry, opposite Cedar Hills.
Charles Hawley, of Bridgeport, ashore below Catskill, Hudson River.
Sarah Starr, New-York for Matagorda, put into Key West in distress, much damaged

D. C. Brooks, at New-York from Port-au-Prince, lost sails, &c., and leaking badly.
Howard, for Baltimore, was spoken, with jibboom gone.
Jonas Sparks, Aspinwall for New-York, put into Wilmington, N. C., March 28, in distress.
E. R. Sawyer, at New-York from Baracoa, lost deck load, &c.
F. Nickerson, at New-York from Charleston, lost boat and some spars.
Pocahontas, at New-York from Havana, run into by a barque, and much damaged.
Challenge, at New-York from Cardenas, lost deck load of molasses, water casks, &c.
Vermont, Porto Cabello for New-York, put into Newport in distress.
Lydia Ellen, (sloop,) was driven ashore 50 miles east of Fire Island.
Wm. J. Pell, (sloop,) was driven ashore 50 miles east of Fire Island.
Two unknown vessels were seen to founder, by pilot-boat New-York.
Ellen Goldsborough, at Richmond from Baltimore, lost sails, March 24.
Augustus Moore, Plymouth, N. C., for Charleston, went ashore on Georgetown Bar, March 20.
Ransom, carried away foremast and head of mainmast, March 25.
Catharine, was run into by schr. Sarah, and immediately sunk.
Greenmay, Norfolk for New-York, is ashore on Barnegat, 3 feet water in hold.
Prospect, Boston for Cardenas, was dismasted, March 19, 126 miles from Cape Henlopen.
Marinah, returned to Lewis, Del., with loss of all moveables on deck.
George Amos, for Belfast, Me., put into Holmes' Hole, had been run into by a schr.
Minerva Crockett, dragged anchors and went ashore on Ingraham's Point, Rockland, Me.
John Tyler, Norfolk for Salem, went ashore on Monomoy Point, March 9.
Granite State, Alvarado for New-York, put into Lewis, Del., with loss of some spars, &c.
Unknown, 70 tons, was passed, March 12, Lat. 36 28 N., Lon. 74 10, water-logged and abandoned.
Emma V., Jacmel for Boston, lost boat, sails, bulwarks, &c.
Agate, at Holmes' Hole for Boston, lost deck load, part of sails and spars.
Virginia Price, at Holmes' Hole for Boston, lost boat, sails, and sprung head of rudder.
Gen. Scott, at Bermuda for Demarara, broke bowsprit, lost sails, and leaking.
Sea Gull, at Providence from Baltimore, lost fore-topmast, and some sails.
John Parker, at Norfolk, was run into, March 9, by a schooner, lost bowsprit, and all attached, &c.
Gen. Armstrong, at New London for New-Haven, lost main-boom, &c.
Excelsior, for Barnegat, was run into by a schooner, and lost bowsprit.
Golden West, Newburyport for Philadelphia, was found, March 27, abandoned.
Mary Ann, Drummond Town for New-York, sprung aleak, and was run ashore.
Anita Damon, at Boston, had been ashore, March 10, at Scituate, Me.
Unknown vessel, about 200 tons, was seen 45 miles S.S E. from Cape Henlopen.
Charles Hill, for Salem, was spoken, bearing away for St. Thomas, in distress.
Unknown vessel, 200 tons, was seen waterlogged and abandoned, Lat. 29 25, Lon. 37
Nevis, for City Point, arrived at Norfolk, March 21, in distress.
A vessel, about 250 tons, was passed bottom up.
Alfaretta, for New-York, put into Lewis, Del.. March 18, leaking.
Marion A. Gould, for Portland, at Holmes' Hole, had been ashore, and lost sails, boat, &c.
Hydrangea, for Baltimore, at Edgartown, March 19, had been in collision and lost bowsprit
Velocity, at New-York from St. Domingo City, lost sails, part of deck load, &c.
Bloomer, New-York for Bermuda, got upon the N.W. reef of Bermuda, lost masts.
Planter, Newcastle for New-York, was abandoned in a sinking condition.
Nile, for York River, put into Norfolk, March 16, with loss of anchors, sails, &c.
Silver Cloud, at Norfolk from Boston, lost sails, spars, &c.
Ben Nevis, for New-York, was abandoned in a sinking condition, March 11, Lat. 37, Lon. 68.
Henry H. Smith, for New-Haven, in collision with schooner Fannie Crocker, and sank immediately.
Unknown, passed 8 miles E. of Absecom, sunk, and all sails set.
Ann, for Charleston, dismasted, March 10, and abandoned in a sinking condition.
Virile, Digby for Boston, totally lost on Brier Island.
Edward King, at Charleston from Searsport, lost sails, &c.
Unknown, was seen, mastheads 10 feet out of water, April 6, Lat. 39 10.
Connecticut, New Berne, N. C., for New-York, at Norfolk, April 6, much damaged in a gale.
Energy, struck the ice breakers at Lewes, Del., April 6, and was abandoned.
Matilda Ann Thompson, New-York for Philadelphia, was abandoned in a sinking condition.
Reunion, Hampden for Rockland, sunk in the Penobscot River, April 4.
Shoal Water, at Charleston from Plymouth, N. C., March 30, got ashore on Cape Romain.
Aid, at Charleston from Havana, shifted cargo, lost sails, &c., March 31.
Effort, at Charleston from New-Orleans, sprung aleak.
Akbar, for Boston, put back to Valparaiso, leaking, March 26.
E. J. Talbot, at New-York from Curacoa, lost sails, &c.
Unknown, was in collision with schooner Ori, off Riker's Island.
G. G. Ross, got ashore on the Middle Ground, Texas.
Ringold, at New-York from Attakapas, lost boats, bulwarks, most of deck load, sails, &c.
Gardiner Pike, (three masted,) for New-York, lost deck load, sails, &c., was making for Norfolk.
Unknown vessel was passed, April 9, near Chincoteague, about 75 or 100 tons.
H. E. Vincent, at Charleston, N. C, lost galley, bulwarks, &c., March 31.
Mary Groton, at Boston from Cardenas, sprung mainmast, and leaking.
N. W. Smith, at Charleston from New-York, lost water-casks, some spars, &c.
Tamoree, at Fall River from Philadelphia, lost some sails, spars, &c.
Unknown, was seen in Little Egg Harbor, with mastheads out of water.

Wm. Smith, New-York for Savannah, in collision with schooner M. E. Pharo; the latter vessel sunk.
Unknown, was seen on her beam ends, 10 miles N.N.W. of Montauk Point.
Storm King, at Savannah from Baltimore, lost bowsprit, sails, &c.
Active, for Yarmouth, N. S., had been dismasted, and was abandoned, crew safe.
Emma Amelia, at Philadelphia, got ashore on Shovelfull Shoal, March 26.
Henry Dunster, at Portland from Cardenas, lost deck load of molasses, April 12.
Mecca, at Portland from Baltimore, with loss of topmast and head of foremast.
Abby Morton, at Norfolk from Caribbean Sea, lost sails, &c.
Unknown, about 200 tons, was seen in Lat. 29 45, Lon. 65, water-logged and stripped.
C. S. Peaslee, at Charleston from New-York, lost sails, some spars, &c.
Elliptic, Kingston, Jam., for New-York, totally wrecked near Cape Antonia, March 26.
Mary Jane, of Gloucester, was capsized near Green Island, crew saved.
Young America, Alexandria for New-York, got ashore on the Flats below New-York.
L. F. Rogers, Mobile for Brazos, was abandoned April 2.
Sappho, Boston for Barnstable, struck on Minot's Ledge, April 15, afterwards sunk.
Buena Vista, grounded on the bar, off Aranzas, and totally lost, March 26.
Alexander Mitchell, (3 masts,) at New-York from Lisbon, lost bulwarks, sails, &c.
Unknown, about 120 tons, was seen water-logged, dismasted and abandoned.
Ann & Sarah, at Providence from Albany, lost 50,000 feet of lumber near Point Judith.
Alice Howe, at Baltimore from St. John's, P. R., cast over deck load of molasses.
Martha, for Plymouth, struck on Minot's Ledge, April 17, and sunk, crew saved.
Diamond, cargo lime, was on fire at Medford, April 13, both masts cut away.
Mountain Wave, at New-York from Porto Cabello, April 10, sprung aleak, lost sails, &c.
J. W. Lindsay, at New-York from Attakapas, lost boat, sails, and part of deck load.
S. J. Brayton, got adrift at Fort Taylor, and got ashore on the Old Breakwater.
Charger, Attakapas for New-York, arrived in distress.

LAUNCHES.

At Warren, R. I., a freighting ship of 670 tons, called the E. Schulz.

At Medford, a fine ship of 1300 tons, called the Good Hope. She is intended for an Atlantic freighter.

At Thomaston, a brig of about 300 tons, called the C. F. O'Brien.

At Cumberland, Me., a clipper barque of about 335 tons, called the Uncle Sam.

At Charlestown, a clipper barque of 800 tons, called the Nathaniel Coggswell.

At Newburyport, a three-mast schooner of 250 tons, called the Edward Hill.

At Cumberland, Me., a brig of about 200 tons, calculated for the West India trade.

At Hodgdon's Mills, Me., a ship of 600 tons, called the Northern Queen.

At Boothbay Harbor, a barque of about 500 tons. Also, a ship of 857 tons, called the John G. Richardson.

At South Boston, a ship of 1,200 tons, called the Vitula.

At Bristol, Me., a freighting ship of 700 tons, called the Highland Light.

At Arrowsic, Me., a brig of 250 tons, called the E. P. Sweet.

At Calais, a schooner of 172 tons, called the G. D. King.

At Mobile, barque Mobile City.

The fine ship "Robert H. Dixey," of 1,200 tons, was launched from the yard of Paul Curtis at East Boston.

Launched from the yard of the. Messrs Shiverick, at East Dennis, a ship of about 1,000 tons, called the Kit Carson.

Commercial Department.

A REVIEW OF THE BRITISH LAWS

FOR THE ADMEASUREMENT OF THE TONNAGE OF MERCHANT SHIPPING.

BY G. MOORSOM, ESQ., OF HER MAJESTY'S CUSTOMS, LONDON.

THE term "Tonnage," as originally applied to mercantile vessels, whether intended to express the burthen that a ship can safely carry, or whether to convey an idea of the relative sizes of vessels, as indicated by the cubical contents of the hold, or space for the stowage of cargo, is by no means unequivocally set forth in the earlier parliamentary documents relating to the subject.

Whatever was originally intended, "tonnage" has been, and still is, the only term by which we form an idea of the magnitude of vessels. And, although when we speak of a ship of 1000 tons burthen, we are quite at a loss to judge, in consequence of the inadequacy of our Admeasurement Laws, whether she will carry a cargo of 1,500 tons, or one of little more than 1,000 tons weight; yet, from our experience and general knowledge of the various proportions of vessels as associated with the results of official measurement, we think we form a pretty good idea of her principal dimensions; and we, therefore, always averse to the inconveniences of change, have appeared almost inclined to be satisfied with this imperfect criterion of size. The establishment of the "New Law," so-called, greatly improved our means of arriving at a more definite idea of the capacity of shipping, but still left this important problem, so intimately connected with the best interests of shipping, in a state of solution highly to be deprecated, and generally conceded to be much behind the intelligence and improvements of the age, which are to be perceived everywhere displaying themselves in all that regards the material connected with far less important interests.

But the evil of such loose and imperfect mensuration as here alluded to, and as has hitherto obtained, does not rest here. If it were limited simply to depriving us of a just conception of the relative magnitude of vessels, no very serious harm or inconve-

nience might arise from such deficiency. But when we consider that not only are all dues to which ships are liable levied according to the tonnage, but vessels are also built, bought and sold for a price per ton of their admeasurement, and frequently freighted on the same basis; and by the regulations of the "Society of Lloyd's Register of British and Foreign Shipping," they must also be timbered and fastened, and have their anchors, cables and boats all in proportion to this same regulating standard; when all these things, added also to the great encouragement given to evasion by imperfect measurement, are brought into review, the importance of the highest degree of truth and perfection in such a standard is made manifest. And, therefore, the apathy which has been evinced on this cardinal point by many of our intelligent ship owners, and more particularly by our merchant ship builders, is truly astonishing.

Erroneous and *empirical* measurement, which cannot possibly be upheld for any other reason than its brevity and ease of application, has been found, even when established on the most proper basis, to be much more injurious in its practical working than the greatest inequalities which are known to be possible to result from the selection of the most ineligible basis, in connection with a mode of *correct* mensuration. And there are those who go so far as to maintain that tonnage may be founded on the principle either of external or internal measurements, on displacement or internal capacity; and, in either case, may be a sufficiently fair criterion of the burthen or size of a vessel, by which to levy the dues, provided the mensuration of each is *correct;* because, it is maintained, all that is required on the part of the interests concerned is, that the duties should be levied *in equal proportions* on all vessels. But this, though it may appear, *prima facie*, to be a very reasonable argument, must be confessed to be fundamentally erroneous, (the condition of its truth, that of the dead weight of the cargoes of vessels being in proportion to their internal capacities for stowage, being wanting) particularly under the present circumstances of an accelerated increase in the construction of iron vessels.

This will appear sufficiently evident, from the consideration that the weight of cargo which a vessel can carry depends en-

tirely, as we know from the principles of hydrostatics, upon the external magnitude of that part of the hull which is immersed by it, and must therefore be quite independent of the cubical contents of the internal capacity of the hold; for the sides or shell of the vessel may be made of any thickness, at pleasure, without the least alteration in the external magnitude, though greatly diminishing the internal capacity. And consequently, as the thickness of the shells of vessels in the present construction of ships—some built of oak, others of fir, and others of iron—is continually varying, (in some instances to the amount of nearly 30 per cent. of the capacity) and therefore bears no constant ratio to the external magnitude, there can be no definite relation between the *external* bulks and *internal* capacities; and hence the dead weight carried, dependent on the former, can be no proportionate measure of the internal capacity for stowage. Consequently, if it be just to levy dues in proportion to the dead weight of cargoes which vessels can carry, it cannot also be just to levy them in proportion to their internal capacities for stowage.*

With the various commissions appointed by the British Government at different periods, for the revision of the law, it has always been a problem whether *internal* or *external* measurement should constitute the basis of tonnage; and from these authorities it has received different solutions. But it is evident, from what has been above stated, that one of these two principles, to the exclusion of the other, must constitute, for general commercial purposes, the most fitting basis for admeasurement; and in which of them the eligibility lies, it will be my aim to endeavor to develop.

In the earlier annals of the British Mercantile Navy, when voyages were almost entirely confined to the crews navigating their vessels, and consequently passengers constituted but little,

* See, in the preceding number of the *Nautical Magazine*, page 45, a letter from the above author, saying, that "both bases for admeasurement," viz.: *internal* and *external*, or the principles of space and dead weight, "may be right," under certain circumstances; a position which we also deem reasonable, after much discussion upon this subject, in which we have advocated the basis of displacement, for good reasons, as we think, as the true one for the promotion of shipbuilding in this country.

if any, of the profits of the owner; when steam vessels, built mainly for passenger traffic, and, therefore, as to their profits, comparatively independent of cargo, were not thought of; when vessels built of iron were equally unknown, and few, probably, were built of anything but oak, this being the indigenous timber of the country; and when, therefore, all vessels were comparatively equally buoyant;—under such a retrospect of the earlier nature and constitution of our commercial shipping, it is only reasonable to suppose that a law to be established for tonnage admeasurement would have reference only to cargo, and that too in its simplest consideration, namely, the greatest weight which a vessel could safely carry. Whatever, therefore, now (the above circumstances of commercial navigation being entirely altered) may be the conviction as to whether displacement or internal capacity be the most eligible basis, there is much reason for supposing that the former principle was entertained by the earlier projectors of the law.

Having made these preliminary observations, with the hope of assisting on these general grounds in removing the uncertainty in which, as at first stated, we have been left by the projectors of the original general law, as to what was intended to be understood by the term "tonnage," whether to express a measure of weight or of space, we pass on to the official admeasurement of vessels in earlier times.

There appears to have been a very partial legislative interference with the operation for determining the tonnage of shipping. It related, primarily, according to our earlier records, only to vessels engaged in some particular branches of trade; and in course of succeeding ages it was extended, prior to its general establishment, partially to others under certain circumstances of suspected evasion of the public revenues.

As early as the year 1422, the ninth year of the reign of King Henry the Fifth, (which appears to be the era having claim to the origin of the legislative admeasurement of British shipping,) we find from existing parliamentary records of that period, this simple enactment: "That keels that carry coals at Newcastle, shall be measured and marked." Also, in the year 1648, in an act of the thirteenth year of the reign of King Charles the

Second, for the remedy of "Deceits" therein complained of, we read—"That Commissioners should, from time to time, be appointed by his Majesty, his heirs and successors, for the admeasuring and marking all and every the keels and other boats," &c., "to be used for the carriage of coals in the port of Newcastle, and all other places within the counties of Northumberland and Durham."

Progressing with our Parliamentary Annals, we arrive at the year 1694, the sixth of the reign of William and Mary, and learn, that whereas the legislature hitherto had been contented simply to direct that the above admeasurement of keels, &c. should be made by Government Commissioners, it was now determined, in consequence of "divers new frauds, deceits, and abuses," that the method of admeasurement should be distinctly defined and prescribed. And, accordingly, it was enacted, that the "said admeasurement shall be by a dead weight of lead or iron, or otherwise, as shall seem meet to the said Commissioners, allowing three and fifty hundred weight to every chaldron of coals," &c.; "and cause the said keels and boats so admeasured, to be marked and nailed on each side of the stem and stern and midships thereof," &c., and "provided that no such keel or boat shall be admeasured, marked or nailed, to carry more than ten such chaldrons at any one time."

This method of admeasuring keels, (limited, at first, to the ports of Northumberland and Durham,) was afterwards extended by Act 15 George III., to vessels used in loading coals at "all other ports of Great Britain." The vessels, as before, to "be admeasured by a dead weight of lead or iron, allowing twenty hundred weight avoirdupois to the ton, and marked and nailed as aforesaid, to denote what quantity of coals each will carry up to the mark so set thereon."

No further progress appears to have been made as regards official admeasurement of coal vessels, (and the laws so far applied to no other,) till in the year 1720, the sixth year of the reign of King George the First, when we find that the attention of Parliament was directed to the necessity of arresting the clandestine trade then carrying on in the importation of foreign spirits, which was found to be facilitated by the smallness of the vessels allowed by law to be employed in the trade.

It was, therefore, enacted, that no spirits should be allowed to be imported in vessels of " thirty tons burthen and under ;" and, "for the preventing disputes that may arise concerning the admeasurement of ships laden with brandy and other spirits," it was also enacted—" That the following rule shall be observed: Take the length of the keel within-board, (so much as she treads on the ground,) and the breadth within-board by the mid-ship beam, from plank to plank, and half the breadth for the depth, then multiply the length by the breadth, and that product by the depth, and divide the whole by ninety-four, the quotient will give the true contents of the tonnage."

These partial enactments extending only to coal and spirit-vessels, and, of course, only to a very small section of the whole mercantile navy, continued to comprise the entire law of admeasurement until the year 1773, when the legislature of that day, called to the consideration of the subject by the " disputes" that were continually arising on various occasions where the tonnage of vessels, trading to and from Great Britain, was necessary to be known and ascertained, deemed " it expedient that one certain rule for this purpose should be settled and established in all csses." And in accordance with this enlarged view of the question, an act was passed, establishing a general rule for the admeasurement of all vessels in every branch of the commercial navy; excepting only those vessels carrying coals, and those employed in the British white herring fisheries.

The first general rule for the admeasurement of vessels in all cases, as above, is briefly as follows :—

"The length shall be taken on a straight line along the rabbet of the keel of the ship, from the back of the main stern-post to a perpendicular line from the fore part of the main stem under the bowsprit, from which subtracting three-fifths of the breadth, the remainder shall be esteemed the just length of the keel to find the tonnage; and the breadth shall be taken from the outside of the outside plank in the broadest place in the ship, be it either above or below the main wales, exclusive of all manner of doubling planks that may be wrought upon the sides of the ship; then multiplying the length of the keel by the breadth so taken, and that product by half the breadth, and dividing the whole by ninety-four, the quotient shall be deemed the true contents of the tonnage."*

* Here is the germ of the United States Tonnage Rule, which differs but little

Subsequent to the establishment of the above, it having been found necessary, occasionally, to measure vessels afloat when the length could not be taken as by this rule directed, an additional act was passed: describing that in the case of measuring vessels afloat, the length shall be taken at the load water-line, from the back of the stern-post to the front of the stem, "subtracting therefrom three inches, for every foot of the load draught of water for the rake abaft, and three-fifths of the ship's breadth for the rake forward, the remainder being the length of the keel for tonnage."

The subsequent introduction of steam navigation seemed to require a modification of the above rules, to ascertain the true tonnage of steam vessels.

In the year 1819, it was enacted, that for the purpose of measuring the tonnage of any vessel propelled by steam, the length of the engine-room shall be deducted from the length of the keel for tonnage as therein prescribed, the remainder being esteemed the just length of the keel to find the tonnage.

From the period of the first introduction of the above general mode of admeasurement, till five or six years after the final close of the French war, no steps had been taken to improve or amend the nature or principle of the rule, although its unjust practical working, as well as its innate tendency to the construction of ill-formed, dull-sailing vessels, had long been sufficiently apparent. But in the year 1821, after maritime commerce had resumed its more natural and legitimate avocations, the injurious effects of the law, in the production of inferior vessels, and in its unjust pressure on the construction of the finer-formed models, (amounting to virtual prohibition,) were felt at last to be so seriously realized, as to induce the government to appoint a Commission of Inquiry on the subject.

The Commissioners reported on the 24th of May, 1821, "that there are sufficient reasons for being dissatisfied with the mode of admeasurement now legally employed," &c., adding, "they would have been desirous of removing all doubt upon the sub-

from the present formula, having made no important progress for a period of 82 years !—[Eds. Nautical Magazine.

ject, by proposing the admeasurement of that portion of the ship which is included between the light and heavy water-lines," (or in other words, the displacement occasioned by the cargo,) "but this method has been considered as liable to insuperable objections, on account of the impossibilities of ascertaining the position of these lines in a satisfactory manner." The report concluded by recommending a "simpler method of measurement and computation," which consisted only of a few internal measurements, proved to be but an inadequate and distant approximation to true mensuration, and being also greatly open to evasion, no legislative results accrued from it, and the "Old Law," as it is designated to this day, being also called the "Builder's Measurement" in Great Britain, was still left, year after year, to its injurious operations; the several acts relating to it being finally consolidated into one during the reign of William the IVth.

(To be continued.)

PASSENGER STEAMERS TO BE MADE LIFE-BOATS.

Our attention has been called to the publication of an inquest held upon the subject of Maritime Disasters, by a jury holding an appointment under the authority of the United States District Court for the Southern District of New-York; and in connection we also find measures recommended for the prevention of all such casualties as that of the lamented Arctic, against the adoption of which, in their present form, we, in common with the nautical mechanics, engineers and mariners, would earnestly protest. We have not been alone in the indulgence of a hope, that the commercial world would never again be afflicted with an exhibition of such a budget of ignorance; with such a complete prostitution of the laws of common sense, emanating from a body of intelligent men, as the inquest of the Grand Jury of this city, who, after a session of more than two months, seemed to have lost sight of both the object and the extent of their commission. But however insignificant and unworthy of notice the first edition of this judicial inquiry may have been, the second

viding for the number of bulkheads, we learn that they are not to be more distant from each other than a space equal to the width of the vessel, and to have doors cut through them. Now let us see how far apart, and how many of them there would be in a vessel 282 feet long, and 47 feet wide—there would be six compartments, and, consequently, five bulkheads; who does not see the inconvenience of receiving and discharging cargo under such restrictions? and who does not see that a vessel so arranged with door-ways is not a *life-boat?*

Now we will show what the life-boat principle proposes,—First, one longitudinal water-tight bulkhead, or keelson, at the centre, if practicable, (and in steamers having two engines, it is always feasible.) Second, one transverse bulkhead near each end of the vessel, water-tight, and without door-ways—this furnishes six compartments, without inconvenience, in receiving, removing or discharging cargo, inasmuch as the same hatch opens to both sides of the vessel. We now have strong *middle, sides* and *ends* to our vessel without inconvenience, or greatly increased cost; and if one end is filled with water, on one side, the vessel is still strong enough to bring all safely into port, without engendering a second disaster, (which would, in many respects, be worse than the first,) being herself a *life-boat,* full and complete, on a scale of twelve inches to every foot.

With regard to the denunciation of the steam-lanes, the jury, we think, are equally at fault, inasmuch as they will be equally well-known and defined to the masters of sailing vessels, and, as a consequence, a more strict watch would be kept while within the path described on the chart. With this, however, at present, we have nothing to do; we propose to build the vessel before navigating her—consequently, "steam-lanes," "whistles," "guns," "signals," "life-preservers," and "life-boats," with the long list of preservatives, will find their proper place, after the *ship* is first made right, and is herself *a life-boat.*

TONNAGE OF THE LAKES.

By John J. Henderson, Esq., Sec'y. of Board of Trade, Buffalo.

(*To be continued.*)

The Great West has now a commerce, within its own limits, nearly as valuable as that which floats between the United States and Europe. Leaving the western rivers out of consideration, and confining ourselves merely to the Lakes, we find a tonnage enrolled and licensed at the several American ports, embracing 110 steamers, 97 propellers, 33 barques, 101 brigs, 639 schooners, and 216 sloops and scows, making an aggregate of 237,830 tons. The history of man does not exhibit a spectacle of such rapid advancement in population, wealth and industry—such energy, perseverance and public spirit, as is manifested in the progress of the western people.

In the year 1794, the treaty known as "Jay's treaty" was concluded between England and the United States, under which the English agreed to surrender the military posts on the American side of the Lakes. The surrender, however, did not take place until the summer of 1796, and from that time only have we used, or had the privilege of using, our great Lakes, over which now floats a commerce of millions of dollars.

The *first* American vessel built on Lake Erie was constructed at Four Mile Creek, near Erie, Pa., in 1797, and was called the "Washington." The first American vessel built on Lake Ontario was at Hanford's Landing, 3 miles below Rochester, in 1798, of 30 tons, and was called the "Jemima." From this time to the commencement of the war of 1812, a large number of vessels were built. Many were lost by storms, and several were captured by the British, during the war, and burnt, so that at the time peace was restored, very few vessels were on the Lakes, except such as had been used by the Government during the war. In 1816, the steamboat Ontario was built on Lake Ontario, and in 1818, the Walk-in-the-Water, at Black Rock. This was the first use of steam on the Lakes.

In 1826, or 1827, the waters of Lake Michigan were first ploughed by steam, and in 1832, the first steamer made its appearance at Chicago. Prior to 1832, the whole commerce west of Detroit was confined almost exclusively to carrying up

comes clothed with authority, emanating, as it does, from a court having jurisdiction over maritime disability; and it is indeed surprising, that upon the investigation of a subject of so grave a character, the court should not have selected men for the jury whose knowledge of the laws of nautical construction, and of maritime pursuits, would have commanded respect for their decisions, which is not, nor cannot be the case, as we are abundantly able to show from the report itself.

We find in the first section of the proposed law to prevent, or guard against collisions, a given rate of speed in times of fog; of this, we shall say nothing, believing that a discriminating public opinion will clearly discover the beclouded state of the jury's vision, when this section was adopted. Upon the second and most important provision recommended, we may remark, first, for the benefit of the jury, and for the information of all who are disposed to dabble with nautical construction, without having *first* learned its laws, that there can be no such thing as safety in vessels without *strength;* and that transverse bulkheads in wooden vessels *without* a longitudinal one in the centre, would, in case of collision, invite a more fearful rupture than the breach at the bow, by the probability of breaking in two lengthwise. It is a universal law of nautical construction, that whatever tends to strengthen a vessel in one part, only operates in the same ratio to weaken the weaker part; consequently, whenever we strengthen one part without reference to the weaker part, if connected, it is at the expense of the weaker part. Hence, it must be clear to every unbiassed mechanical mind, that to secure a large increase of strength transversely, without having first made the vessel strong longitudinally, would be to subject the vessel to a more fearful disaster than collision itself. It is well known to every practical man, that the weakest part of all wooden vessels, of any considerable length, is along the line of keel and keelson, consequent partly upon the vessel having a smaller amount of material, proportionately to the bulk of ihe vessel, than other parts, but chiefly upon the radiating torces which operate in this direction, in addition to the tenfdency to *bend, or yield to the form of the wave,* the effects of which may be seen on all vessels of any considerable size upon

any dry or sectional dock, where repairs are made, and where the deformed shape of the keel may be seen; indeed, so weak are they at this part, that large vessels are often *hogged* in launching; and we may safely affirm, that there is not a single wooden vessel in the United States, government or merchant, 200 feet long, that has not yielded to those influences, and become hogged, unless prevented by something more than the ordinary keelsons. But we are told that the keel and keelson are the back-bone of the vessel, and these are pointed to as the fountain of strength, because of their bulk. We ask the sincere in quirer after truth to remember that this bulk of timber is made up of short lengths, say 50 to 60 feet at the farthest, and we may not count upon half of this bulk for strength; besides, if it were all in one length, the material is not sufficiently *rigid* to furnish the strength required. Let it also be remembered, that the "*Vesta*," of which so much has been said, was an *iron* vessel, and had not only her keelson in one continuous length, by the mode of construction, but the material was of iron, and could be made, and doubtless was, sufficiently strong to resist the increased longitudinal strain consequent upon the increase of transverse strength furnished by the bulkheads. Let us assume that a steamer having transverse bulkheads only, were to receive an injury at the bow, and that this section were filled with water as a consequence, would not this enormous weight at the end of the vessel cause a rupture amid-ships when the bow protruded beyond the wave?

The bottom and bilge of all vessels are hid from view, consequently we do not know as readily the effect of those forces which operate to destroy vessels; the sides are seen, and if any defect is discovered, it is at once provided for; the sides do not, therefore, furnish the index of deformity in the bottom, being strengthened by iron plates on the frame, and the great bulk of planking edgewise, shows no deflection from original shape above water; but does not all this excessive strength on the sides, above those weaker parts, cause a still greater deflection at the centre? But again, it is amusing, as well as afflicting to the practical man, to see what pains the jury have taken to trammel commerce with burdensome and expensive restrictions; in pro-

gitimately gained by the aid of nautical skill and of keen observation, united to a wise application of scientific principles, as those which have occurred along the greater extent of our national seaboard. A few short years have witnessed the bark canoe displaced by a fleet superior to the entire marine of many nations, and the same lapse of time will find the country fully developed—agriculture in its highest state of perfection, a region rich in treasures of iron, lead, copper, coal, and various other products of the mine, yielding rich rewards, and the broad expanse of water of the lake region whitened with the sails of a gigantic commerce; for, as yet, we are but in our infancy.

The influence of railroads upon the commerce of the lake region is marked. Already are the south and east shores of the chain of lakes lined with railroads which are fast drawing passenger travel from the lakes, and the day is not far distant when the locomotive will traverse each shore of all these inland seas. What such an event will accomplish it is difficult to conceive; but thus far, the effect in working a change in the character of the lake commerce is perceptible. Except to fill fragments of railroad routes, first class steamers are of little account and are fast diminishing in number. In the meantime, steam vessels, built with reference to safety and capacity of tonnage and economy in working them, are rapidly multiplying. A fine fleet of propellers is now doing the great bulk of freighting business on the lakes, showing conclusively that steam is growing more rapidly into favor and trade so admirably adapted in its successful application as that of the western lakes.

In 1843, we believe, the first freight propeller was built on the lakes, and was called the *Hercules*. In 1845, there were only eight, and ten new ones were added to the list during the following year. In 1849, there were 45 propellers on the lakes, and in 1854 the number was increased to 97.

A Zinc Vessel.—A French schooner, called the *Comte Lehon*, built of *zinc*, was launched last summer, 1854, from M. Guibert's dockyard at Nantes, and has made a successful voyage to Rio de Janeiro, whence she sailed for Marseilles, and is now a regular trader. The zinc plates are riveted with wrought zinc rivets

EUROPEAN LETTERS.

WRITTEN FOR THE NAUTICAL MAGAZINE.

SHORES OF THE BALTIC, *March* 9, 1855.

EDITORS OF THE NAUTICAL MAGAZINE:—Having to keep up a large business correspondence in addition to the duties devolving upon me as the constructor of one brig and two steamboats now on the stocks, I have been quite unable to be as punctual as I wish to be in forwarding my letters to you.

Up to the present time I have received five numbers of the *Nautical Magazine*, and, having perused them, am now able to give you my candid opinion of the work. There exists no doubt that the magazine fills a great want in the useful literature of your country. I was quite surprised while I was paying my late visit to your rapidly progressing country, that no man had at that time started the idea, and cast life into the thought of a periodical which took hold of nautical, commercial, and ship-building matters exclusively. Of what inspiring influence such a periodical is to large branches of business, other countries tell; and yours will thankfully acknowledge the fact, after your new enterprise has riven the resistance of novelty and prejudice which blockades all new undertakings.

It appears that the many losses at sea which have occurred during the past year have drawn forth investigations to the very bottom. Amongst the many professional and non-professional men who have put their minds to work to devise a remedy, I find with pleasure that you stand foremost among the former. The *staunch* ship is the greatest safeguard of life at sea. Make the ship such, and you do not want the "life-boat," or "life-preserver," which, at best, are but poor substitutes for what they profess to be. Next, navigate your ships cautiously. Provide steam-whistles to be sounded in time of fog and darkness, and collisions will seldom or never occur.

Regarding commercial business, very little can be said with any degree of certainty. Articles of food command high prices and high freights, in consequence of small harvests and fear that war may prevent importations in countries where such are mostly wanted (England, especially.). So do the materials for

war command high prices, viz.: iron, copper, coal, hemp, tallow, &c., &c., I send you the price current of different articles as they are bought and sold at different ports in Germany.

At the Ports of Dantzig, Pillau, Memel, in Prussia.—Wheat, 63 to 66 Eng. shillings per quarter; rye, 38s.; barley, 29 to 30s.; peas, 35s.; spirits, $20 per cask, at 96 traller.

At the Port of Stettin.—Wheat, 54 to 60 Eng. shillings per quarter; rye, 38 to 39s.; barley, 26 to 29s.; peas, 33 to 35s.; oats, 19 to 20s.; rape-oil, 10s.

PRICES OF NEW BUILT SHIPS, COPPER-FASTENED, READY FOR SEA.

Length on deck,	126 feet;	breadth, 29 feet;	depth, 16½ feet,	....$24,000
" "	110 "	" 27 "	" 14 "	 18,000
" "	150 "	" 33 "	" 20 "	 40,000
"	180 "	" 36 "	" 25 "	 55,000

The price of oak ship timber varies, according to quality, from 18 to 60 cents per cubic foot; 35 cents being the average price. Pine is worth 20 cents, average price. The cwt. of ship cordage about $15. The iron, copper, and yellow metal, *used for shipbuilding*, is imported into Prussia free of duty; while these articles, when intended for other purposes, pay a high duty. This is done to encourage shipbuilding in Prussia, and it has already done so to such an extent that Prussian built ships have been sold to and built for Holland, and even for England. We can build cheaper here than in some parts of the United States, as above prices show. Yours, truly, H. A. G.

LIGHTNING RODS FOR SHIPS.

THE security of life and property on ship-board which is attained through the instrumentality of these simple yet efficient protectors, has never yet, as we think, been properly appreciated. The novelty of protecting our ships from the most shocking casualties which frequently occur at sea, and in port, too, from the visitations of lightning, is fast wearing away. The prudent merchant and the careful commander, as well as the thoughtful underwriter, no longer deems the outfit of a ship complete if not provided with lightning conductors. In evidence of this, the fact is significant that the Board of Underwriters of New-York make a deduction of 2½ per cent. upon the cost of insuring vessels thus protected. It gives us pleasure to say, that A. M. Quimby & Son, of this city, have established a business of fitting these invaluable protectors to all vessels sailing from New-York. Having examined their manner of supplying lightning rods on several of the finest ships out of this port, we have no hesitation in recommending their system to every ship-owner having a vessel worth the insuring. We refer the reader to their business card in this number.

THE NEW PASSENGER LAW,

AND SECRETARY GUTHRIE'S CIRCULAR.

THE Secretary of the Treasury has issued a circular containing instructions to the Collectors of Customs for the proper execution of the new Passenger Law, in which he defines the distance "between decks" to be the space between the beams of the deck above and the surface of the deck below, or, in other words, he does not include the moulding size of beams in the so-called distance *between decks*. Now, although this may have been the meaning of Congress, seeing there are no ship-builders in that body, or any who understand quite as much as they ought of the most important manufacture of the country, yet it is not a correct interpretation of the phrase alluded to, as ship-builders use the term. The true distance between decks is the space contained between the upper surface of one deck and the under surface of the other. The *beams*, although the frame of the "deck," yet are not "*the* deck."

It is not unlikely that this rendering of the law will bear against the employment of two-decked vessels, to which it applies, in the passenger trade, inasmuch as this new requirement calls for eight or ten inches more "distance between decks" than is usually given to this class of vessels, which is frequently the best, in some trades, at least, for health and safety, in ocean transit. It has been uniformly the case to measure all distances between decks according to the literal meaning of those words, and the nautical world will be reluctant to receive any other definition.

SHIP STOCK PRICES.

BOSTON, *April 22d*, 1855.

MESSRS. GRIFFITHS & BATES:

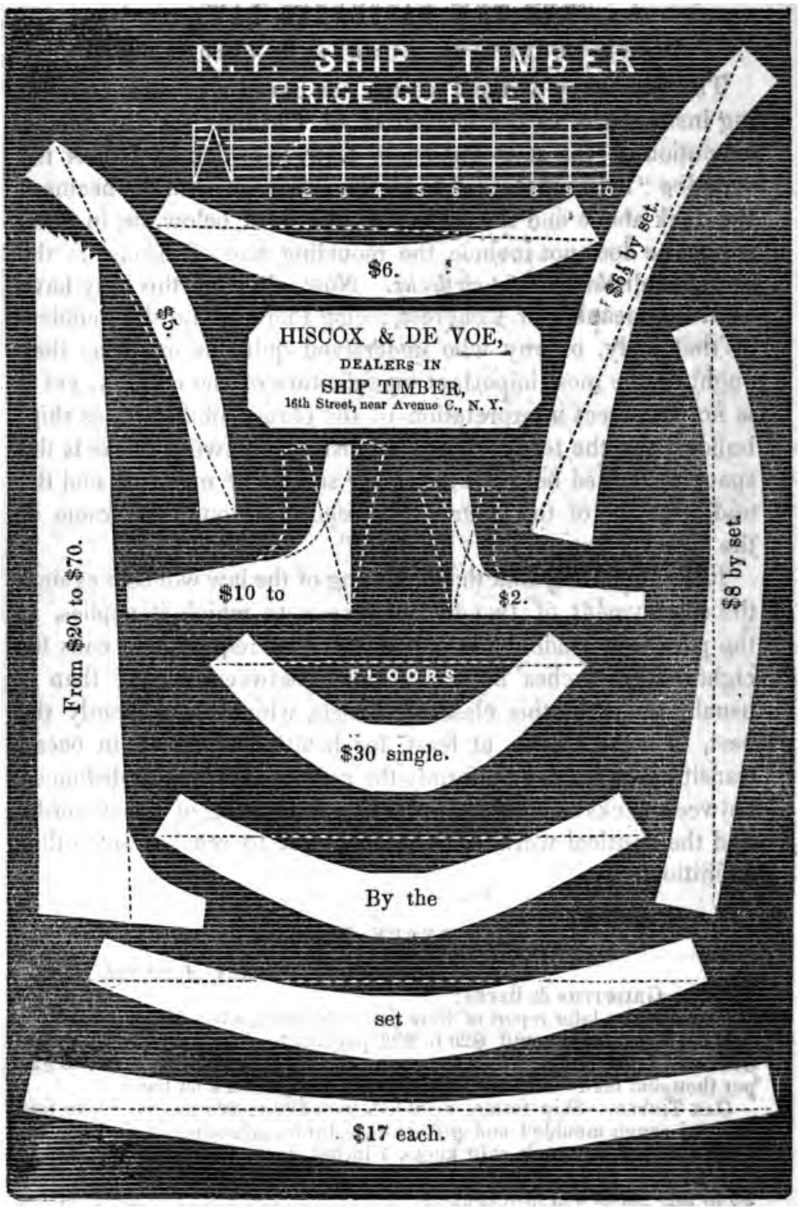
Please find a later report of SHIP STOCK MARKET—Wholesale Prices.

HARD PINE.—Ship stuff, $20 to $22 per thousand feet, for rough edged; $24 to $26 per thousand feet, for square edged; flooring boards, $17 to $20 per thousand feet. Demand limited, with a large stock on hand.

OAK TIMBER.—Ship frame, moulded, from $20 to $25 per ton, of 40 feet timber; rough moulded and promiscuous timber, (Southern and Northern oak,) $15 per ton; oak ship knees, 7 inches, from $2 50 to $3; 8 inches from $3 25 to $3 75; 9 inches, from $4 to $5; 10 inches and upwards, from $5 to $8; hooks and floor timbers

HACKMATACK.—Ship knees, per cargo, 7 inches average, 33 cts. per inch; 8 inches average, 37½ cts. per inch; sided timber, $8 per ton.

Respectfully yours, JOEL KNIGHT



A set of floors and futtocks, $9 each piece. Flitch timber, 30 to 35 cents per cubic foot; oak plank, $40 per M.; deck plank, $30 per M.; hackmatack timber, 25 cents per cubic foot; chestnut, ditto; cedar, 60 to 75 cents; yellow pine timber, rough, $25 to $35; ditto, sawed, $30; yellow pine plank, $26 to $30 per M.

KNEES.—Oak, 5 inch, $3 each; hackmatack, $1.50; oak knees, 6 inches, $5; hackmatack, $3; oak knees, 7 inches, $7; hackmatack, $4.75; oak knees, 8 inches, $10; hackmatack, $6; oak knees, 9 inches, $12; hackmatack, $7; oak knees, 10 inches, $15; hackmatack, $10; oak knees, 10 to 12 inches, $15 to $20; hackmatack, $11 to $12. Locust remains as quoted in November last.

RATES OF COMMISSION.

Recommended for general adoption, and allowed by the New-York Chamber of Commerce when no agreement exists to the contrary.

ON FOREIGN BUSINESS.

Sale of Merchandise	5
Sale or Purchase of Stocks	1
Sale or Purchase of Specie	½
Purchase and Shipment of Merchandise, with funds in hand; ON THE AGGREGATE AMOUNT OF COSTS AND CHARGES	2½
Drawing or Endorsing Bills, in all cases	2½
Vessels—Selling or Purchasing	2½
Freight Procuring	2½
Collecting Freight, on general average	2½
Outfits or Disbursements, with funds in hand	2½
Effecting Marine Insurance, in all cases when the premium does not exceed 10 per cent.—ON THE AMOUNT INSURED	½
Effecting Marine Insurance, in all cases when the premium exceeds 10 per cent.—ON THE AMOUNT OF PREMIUM	5
Collecting Dividends on Stocks	½
Collecting Delayed or Litigated Accounts	5
Adjusting and Collecting Insurance Losses	2½
Receiving and Paying Moneys, from which no other Commission is derived	1
Remittances in Bills, in all cases	½
Landing and Reshipping Goods from vessels in distress—ON THE VALUE	2½
Receiving and Forwarding Goods, entered at the Custom-house—ON THE VALUE	1
And on responsibilities incurred	2½

ON INLAND BUSINESS.

Sale of Merchandise	2½
Purchase and Shipment of Merchandise, or accepting for Purchases without funds or property in hand	2½
Sale or Purchase of Stocks	1
Sale or Purchase of Specie	½
Sale or Purchase of Bills of Exchange, without endorsing	½
Sale or Purchase of Bank Notes, or Drafts, not current	½
Selling and Endorsing Bills of Exchange	2½
Vessels—Selling or Purchasing	2½
Chartering to proceed to other Ports to load	2½
Procuring or collecting Freight	2½
Outfits or Disbursements	2½
Collecting, general average	2½
Effecting Marine Insurance, in all cases when the premium does not exceed 10 per cent.—ON THE AMOUNT INSURED	½
Effecting Marine Insurance, in all cases when the premium exceeds 10 per cent.—ON THE AMOUNT OF PREMIUM	5
Adjusting and Collecting Insurance Losses	2½
Collecting Dividends on Stocks	½
Collecting Bills, and paying over the amount, or Receiving and Paying Moneys from which no other Commission is derived	1
Receiving and Forwarding Goods—ON THE VALUE	½
The same, when entered for Duty or Debenture	1
Remittances in cases, in Bills	½

The above Commissions to be exclusive of the guarantee of debts for Sales on Credit, Storage, Brokerage, and every other charge actually incurred. The risk of loss by fire, unless insurance be ordered, and of robbery, theft, and other unavoidable occurrences, if the usual care be taken to secure the property, is in all cases to be borne by the proprietor of the goods. When Bills are remitted for collection, and are returned, under protest, for non-acceptance or non-payment, the same commission to be charged as though they were duly honored. On Consignments of Merchandise, withdrawn or reshipped, full Commission to be charged to the extent of advances or responsibilities incurred, and half Commission on the residue of the value.

CLIPPER SCHOONERS FOR PRIVATEERING.

Armed Vessels to be built.—The Boston *Bee* says, an extensive ship-builder at Medford, Mass., has received orders to build, at the earliest moment, five vessels, of about five hundred tons each, upon the most improved clipper model. When completed for sea they are to carry eight guns, four on a side, and are to be fitted expressly for privateering, or similar service.

It may not be amiss to inquire what description of vessel is best adapted to the purpose of war, whether the vessels are to belong to the general government, or to private individuals, and as a consequence denominated *privateers*. The time may not be far distant when the *Cuban*, or some other knotty question, may place the United States in a belligerent aspect towards a hitherto peaceful nation. Hence the question may not be deemed inappropriate, seeing that our eastern friends have begun to prepare on private account for what, to many, seems not improbable. Those vessels are set down at 500 tons each; quite small enough. But what is to be their dimensions, and what their draught of water, are questions which seem to us to have some significance. The war between the *Czar* and the *Allies* has shown the folly of building large ships with small guns; in other words, heavy draught of water has rendered the wooden walls of England a useless appendage to royalty, or sovereignty on the seas; and shall we profit by the folly of England? The most efficient vessel that can be built of about the size above named would be one that would not draw more than eight feet of water, 150 feet long on load line, 34 feet wide and 10 feet depth of hold, with iron centre keelson and centre-board, eight 68 pounder battery guns, and 1 11-inch pivot gun, rigged brig forward, with three masts, poop and top-gallant forecastle. A vessel properly built, of this description, would be the most formidable vessel of her tonnage and cost ever yet built. She could run into any of our southern ports, and, if properly modelled, would sail with and be a match for any clipper yet built, both in sailing and sea qualities, and carry and work her guns in all weather, her battery being as high as any corvette in the Navy drawing double the draught of water.

THE

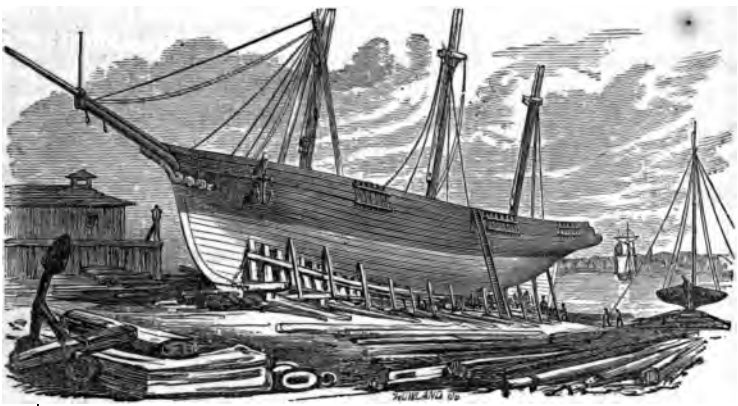
Monthly Nautical Magazine

AND

QUARTERLY REVIEW.

Vol. II.] JUNE, 1855. [No. 3.

Mechanical Department.



THE TEREDO, OR SALT WATER WORM.

(Concluded.)

In the harbor of Baltimore, as high as the basin, the worm does not generate, and as far down in the harbor as Tell's Point, the animal does but little damage. Rafts of timber remain in the docks without being injured all the summer. It is not advisable to risk a vessel's bottom *unprepared* as low down as Fort McHenry, and nowhere in the Chesapeake Bay. I believe it dangerous to risk vessel's bottoms *unprepared* in any river, inlet, or creek, five miles from their mouths, or entrances which empty in the Chesapeake. In the harbor of Boston and Ports-

mouth, N. H., it is unnecessary for piles to be charred or to have the bark on, or to have paints and other substances on them; for the timber is submerged secure from serious damage of the insect twenty-five years; that length of time will be as long as the exposed part of the piles to open air will continue clear of decay unless kept under cover. I would prepare all the piles, or leave the bark on them, which I should drive in the harbor of New-York, and also in Baltimore. I believe that a very dry summer or season will be the cause of the Teredo generating in the harbor of Baltimore below the basin: there have been such seasons. It is best to have all piles driven near the wharves of New-York city, in the East or North Rivers, prepared against the insect. In this harbor (of Norfolk and Portsmouth, Va.,) and its vicinity, it is positively necessary that piles be protected by being driven *in bark;* or preserved in another manner made plain in this communication. The bottom plank of a ship *unprotected* here, and kept submerged one summer, will be destroyed; the *inside,* that is, the wood betwixt the out and inside surface of the plank, will be riddled to a honey-comb in appearance, and although so riddled, there cannot be seen an orifice in the surface where the animal *enters.* I underscore the word *enters,* because one writer says that the worm enters into the minute pores or perforations of the wood. It may be so; these animals may *enter,* but I doubt it; and I doubt that any man, living or dead, ever saw one of these insects 'excluded' from the egg. Some suppose the insect *enters* through the pores of the wood; and this may be so, yet I still doubt. I do not believe that the salt water worm, the Teredo, can exist in the element known as salt water, which is required to aid in its generation. I believe it is possible that these creatures may be brought into life, into being, by natural chemical action, or process, the water and caloric acting on the wood. I ask all the philosophers if it is impossible that these insects can be generated immediately under an *indescribable thinness* of the surface of the wood. It is certain, that as soon as brought forth, *no matter how,* they commence their ravages. On the surface of the wood exposed, there is never a visible sign of an orifice whilst the wood is wet. Mark this: the sixteenth of an inch from where

we may say is the embryo, they have grown to a size in diameter equal to the distance grown ahead.

These animals have a bivalved head, ‹r auger, two parts working a joint something like small pearl cups, with fine cutters; *teeth,* that look under the microscope well adapted to the destructive purpose, were the substance a custard to pass through, instead of its being, as it is often, a hard pine knot. How strange it is, that these creatures will perforate the hardest wood! I am almost of opinion that these animals have a power (perhaps a peculiar acid,) with which the hardest substance can be softened and perforated. These destructive insects have two tubular tails; the tubes are minute, but the water, or oxygen, can be drawn through, and is drawn in sufficient quantities to give full respiration and a supply of water for purposes unknown to me, unless for the purpose of aiding in the manufacture of the mantle of carbonate of lime. These tails seem to be the base or root from which the animal terminates. When a specimen is first taken out of the wood that has been exposed *unprepared,* no sign of these tails can be seen—no orifice is in view; but as soon as the wood becomes dry, these animals *thrust* their tails through the indescribable thinness to get sustenance, to obtain a supply of water and oxygen, as before stated. When a ship's bottom is examined, which has not been prepared against the generation of the Teredo, and the bottom plank becomes dry, hundreds of the tails can be seen thrust through that were invisible when the bottom plank was first cleansed of the sea-weed. It is to get a supply of water that these animals use their tubular tails. These Teredines are never found in any other substance beside wood. If there are animals found burrowing in stone, they are a different species of worm, and not at all like the sea-worm, known by naturalists as the Teredo. This insect is never found in the bark of any wood. The animal cannot live in water. I know also that they cannot exist in air. Their only home is in wood, and that wood must be in water, or the animal cannot, but for a brief period, exist. I have taken them out of their cells as carefully as possible, handled them as tenderly as I would the smallest thread of jelly to keep them from breaking asunder;

(for taken by their mouth-piece and held up, their bodies separate—they are so tenderly composed, that they will not bear their own weight.) I have softly placed them in a bucket of water; they sink and drown sooner than I would, submerged. I have gently placed them on a sheet of foolscap paper; they die immediately. I have thrown them in the river; they are unable to take care of themselves. They cannot swim; they sink and die, and wash to pieces, as so much paste made of flour. There are philosophers who believe that these animals are generated in the water by procreation, and that when invisible to the naked eye, attach themselves to the bottom plank of ships which are unprepared, and bury themselves in an orifice so small, as to be invisible to the most penetrating search without a powerful lens. I will not say where or how they are "brought forth." The *water* may bring them into existence in connection with *caloric* and *wood.* It seems that Natural Philosophy will not admit, or believe it possible, that these animals can be generated in any other way than by common procreation. It has not been a great while since I read in the *National Intelligencer,* of a chemist in England bringing into being a bug, a living animal, by a chemical process. The acids are named from which life was produced. If this is so, I cannot see why the chemical action of a peculiar water, caloric, oxygen, and wood, in a suitable atmosphere or temperature, should not bring into existence the very Teredo. If these animals or their eggs are in the waters of this harbor, meandering through the floods and ebbs, I have been unable to discover any animalcula at all resembling the sea-worm. Here we have one of the most powerful microscopes in the country. I have examined so many drops of water from the river here without effect, that I have abandoned all hope of ever seeing in the water the Teredo in embryo, unless I find it in its own home—its true element, wood.

One of the writers on the Teredo says, they were originally brought from India. My opinion is, we are as apt to carry them as to bring them. I am almost certain that the Aborigines of this country, who had never heard of India, had to take their canoes out of the water, if they were anywhere on the Chesapeake Bay or its tributaries five miles from their entrance.

Another repeats nearly the same language, and says, these animals were brought from the Torrid Zone. This fact is certain, that should all the wood material be taken from the waters of all the world where the temperature assists in the generation of these insects, and be kept from the waters of all climates fifty or five hundred years, there would be no such animal seen for the space of five hundred years. But at the end of five hundred years, fill all the rivers with the usual quantity of wood, and in one summer millions of these destructive creatures will be generated. During this great length of time, is it possible for the egg to be rolling through the ocean wave? If in embryo, and deposited in the waters, what has hindered it from coming to perfection? I leave this part of the history to philosophers to solve. For my single self, I cannot say positively *how* these animals are brought forth. I can only appeal to a high authority, "Let the waters bring forth abundantly the moving creature that hath life."

These animals, with all their destructive powers, never bore through a ship's bottom plank; never pass through to open space. The empty boxes which I have had in the river prove this beyond all doubt. More than one hundred boxes have been examined, and not an orifice to be seen on the inside surface of the boxes, and no place of entering in the outside surface. All the parts that are injured by the worm is *betwixt* the outer and inside surfaces. If two pieces of wood are fitted together, (as the bottom plank is to the timbers,) the insects will pass on as if it was a solid block; but the Teredo never passes through into open space that is betwixt two timbers. Truly may it be said, these creatures are the cause of many ships being "in the deep sea of the ocean buried."

So far, I have seen no species of wood "*bitter*" or sweet, except the Palmetto, or cabbage tree, that the worms will not generate in or *enter*, if Philosophy insists on the animal *entering* the wood, instead of being generated under the *thin* surface, as I am almost forced to believe is the case.

I have prepared many of the empty boxes by painting them, leaving a small part (the end edges) *bare*, purposely to invite generation, and have never failed to produce the animal, or for

the worm to be brought forth at the part left bare. I have prepared rods not more than one fourth of an inch in diameter, with different kinds of paints, leaving one end bare. The worm has never failed to generate at the *bare* end, and to continue its boring to the other end of the rod one foot in length, the tubular tails always remaining where generation took place. The boxes prepared with paint have not been damaged, except from the injury commencing at the select part left bare. The boards of the boxes were generally three-eighths of an inch thick. By holding the box up to the light after the death of the insects, the meandering of the worm can be traced coming very close to the outside, and as close to the inside surface, but never passing through into the water or to open space inside of the *surface.* As these insects progress through the wood, they take care to keep in separate cells. How strange it is, when their mouth-pieces come to an *inconceivable* thinness near the outside surface, or very near one of their species, they "try back," turn from the opening they would cause by interfering with their neighbor's habitation.

It is a fact, that many ships proceed to sea, having parts of their bottoms unprepared, perhaps a sheet of copper off, which is unknown to captains, owners, or underwriters. One nail hole in a sheet of copper neglected, having no nail driven in it to stop the vacancy, might be the cause of the loss of a ship. Wherever the water can act on the wood, (in a climate where the worm is produced,) it is certain the insects will be found. A ship in Norfolk harbor, her bottom may be supposed to be in good order, perfect, and the bottom may be minus one or more sheets of copper, there being no protection after the copper is off, the worms, if the ship remains in Pensacola, or the Havanna, six weeks, will completely destroy the inside of the plank, that is, betwixt the inside and outer surface; the perforated part of the bottom plank may strike against a hard object at sea, the plank being a honey-comb, will be broken, and the ship lost. This may have been the fate of the Albany sloop-of-war.

I do not doubt the foregoing has frequently been the case. When a ship's bottom is not protected with copper, frequent search should be made for these great enemies to commerce. By

strict attention to these creatures, many lives and much valable property may be saved. It has been observed by a writer, when referring to the sea-worm, that they were useful to commerce, that they destroy floating wrecks, wrecks at sea, sunken obstructions of wood in harbors, &c.

In specimens of wood left in the river for more than one season, there will be found, after the winter has passed away, the animal alive in many of the cells; there will also be cells without the animal, having died, the crustaceous mantle gets broken, and the insect (a mere paste) is worked away by the waters. I believe I have said enough of these enemies to a commercia world, regarding all foundations in salt water rivers requiring piling, and wood material generally wherever kept in salt water in a temperate climate. In regard to the preventives, the means of avoiding these destructive creatures, I will offer a few remarks.

Tredgold says, the insect never touches bitter wood. I have had in the river wood of all kinds extant in this country, including lignum vitæ, camphor-wood, and hard pitch-pine knots; the insect will generate in all that I have tried, except the bark of wood and palmetto or cabbage tree, as before observed. The above gentleman says, that charring the surface is not found to be "of any use." He is certainly mistaken. No worm can generate in charcoal. The substance is too pure to admit generation. If generated and abroad in the waters, they cannot *enter* charcoal. The charred part must be rubbed off before the worm can do damage. A pile may remain submerged for a century if the charred part be perfect. Should the charred part be worn off by the flowing and ebbing of the tides, and the wood be subject to the action of the salt water (in a suitable climate,) the insect is sure to appear. One great neglect in charring is, that the heat required to burn the wood to charcoal on its outside surface will cause a disruption or fissure that the fire does not search. This *crack* remains unchanged, the water reaches the naked wood of the fissure's bottom, and the Teredo is in being. Fill these fissures or disruptions with *hot* coal tar, and the piles will be safe as long as the charring is perfect, and the coal tar does not pass off; or the fissures might be filled with

white zinc paint, white lead, red lead, tallow, or any strong paint or substance, such as pitch, &c. The piles will remain secure from the attack of the worm as long as the charring and paints remain uninjured, which would be some years, as the friction of the tides would be the only cause, if any, of the removal of the protective power. Sheets of copper are used by all the mercantile and naval world as the very best article to prevent the generation of these terrible creatures. It lasts longer, and is cheaper in the end, than any other metallic substance. Sheets of iron or tin soon corrode and become loose; the barnacle and sea-weed fasten on it much more than on copper. Sheets of zinc have been used; they do not seem to be patronised. Sheet lead is too heavy. Any strong-bodied paint, such as white zinc, brown zinc, and black zinc paints, Ross' metallic, Edwards' red, red lead, white lead, will for a year or two keep the Teredo from generating in the bottom of a ship. Three coats of naphtha and coal tar, applied *hot* to the dry wood, that the pores may be filled with the liquid, will keep the insect from generating, provided these applications are not rubbed off, so as to leave the wood naked. It is quite possible after a year or two the paints will become insipid, and come off in sheets, or scales, familiarly called "scaling off;" whenever this takes place the wood is in danger, not more so than if a sheet of copper gets broken or torn off. It seems that the coal tar and the naphtha in particular may pass away by being dissipated. I repeat, as long as the substance can be kept on the wood, it will be protected from the water, and whilst the water cannot act on the wood, the germ, *if abroad,* cannot lodge on the *naked* wood. It has been suggested, that if wood was first saturated in corrosive sublimate, and then well painted, that it would be certain to protect the wood. It would be found quite troublesome to saturate the bottom plank of a large ship before it was put on the frame. Three coats of white zinc paint would have the same effect to keep the insect from the wood, as the poison and two coats of white zinc paint. If the above preventives or preparations could be kept *on* the wood in as pure a condition as it can be applied in its original purity, the three coats of white zinc paint, and the *two* coats of white zinc paint

and the poison, would be equal preventives. The bark of all trees, as long as it can be kept on, is positively one of the best securities for piles, except copper. This invaluable metal is superior to all metals and other substances known as a protector of wood from the salt water worm. *But white zinc paint is superior to copper to keep the coral deposits off the bottoms of ships.* The deposits in the West Indies are often in the form of vegetation, viz.: trees with their branches, which are all tubular, and contain insects; in fact, the insects are the generating power of bringing forth coral, and commencing on coral, continues until islands and continents are built up, or produced by them and an Almighty power. In Norfolk harbor, the common barnacle and oyster are the deposits. These excrescences are great hindrances to the sailing of ships. When a ship's bottom is filled with sea-weed, or the common barnacle, or any other coral formation, the sailors say, the ship is "very foul, and cannot sail fast." These carbonate of lime deposits all come from, and are brought into existence by the power of the zoophyte; these animals are the embryo. How the generation of the zoophyte takes place, God only knows! I speak of the deposits more particularly, because many believe that the barnacle is of the same genus as the Teredo. They are different animals. Many ships have their wood bottom plank filled with barnacles, and there is no sign of the worms, and vice versa, bottom plank have worms in them, and no sign of a coral deposit. I have exhibited specimens of iron and wood to the Honorable James C. Dobbin, Secretary of the Navy, and to Commodore Joseph Smith, Chief of Bureau of Yards and Docks; the specimens are demonstrations that the salt water worm cannot *enter* or generate in wood whilst there are perfect coats of white zinc paint on the wood, and that there cannot be any barnacle or coral deposit of any kind where there are three coats of white zinc paint on metallic substances or wood. I recommend the white zinc paint, and believe it will protect *copper*, as it does iron and wood, from coral formations, provided the copper does not, by chemical galvanic action, destroy the paint. Since I wrote the last paragraph, I have ascertained from my experiments, that the white zinc on copper fully keeps off all coral

deposits, and that it does not become injured by the action of the copper.

If the Honorable Secretary of the Navy would grant me permission to secure the bottoms of our ships from the ravages of the salt water worm and from the coral deposits, I would apply three coats of white zinc paint on the *dry bottoms* of all our ships, then copper the bottoms; and to make the whole invulnerable to the worm and to the coral deposits, I would apply three coats of white zinc paint on the outside surface of the ship's bottom. I am perfectly satisfied that many ships are lost because their bottoms are destroyed by the worm, which is unknown to the captain and crew, because of a sheet of copper being off.

This is nearly a copy of the letter; but there are some alterations which I could not avoid, in making a copy from the original.

Very respectfully,

James Jarvis.

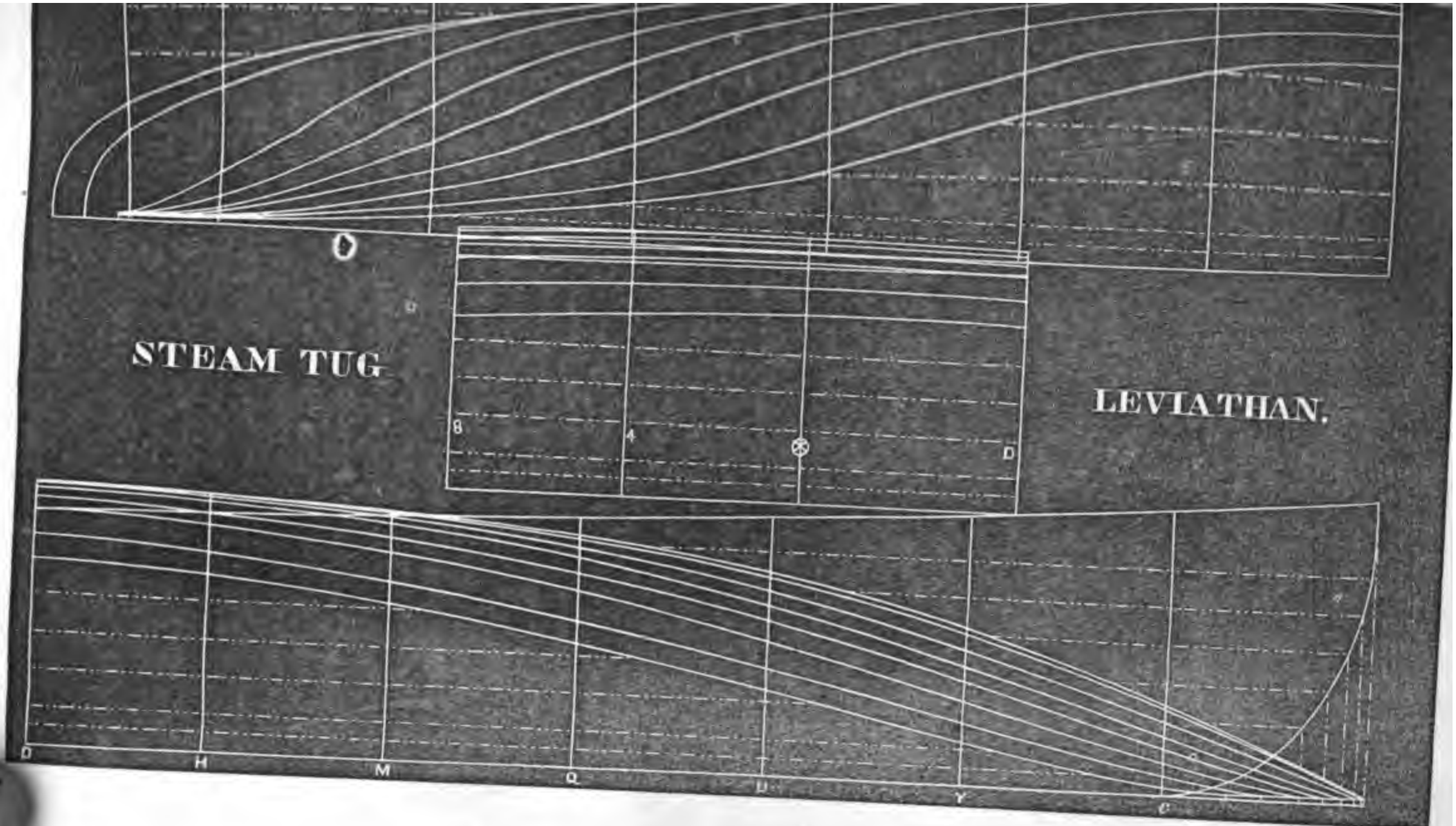
THE STEAM-TUG LEVIATHAN, OF NEW-YORK HARBOR.

By the courtesy of her builder, we are enabled to furnish the draft and mould-loft tables, with other particulars, of one of the swiftest sea-steamers yet built in the United States. The steam-tug "Leviathan," although built for a tow-boat solely, is probably one of the finest performers of her capacity to be found in the world. She is a good model, and is furnished with a powerful engine, a large wheel, and great proportionate area of blade surface. Above the deck she presents but few obstructions to the atmosphere, such only as wheel and pilot houses, engine-frame and chimney, and low bulwarks.

The hull was built by Eckford Webb, Esq., and the engines by the Allaire Works, New-York.

DIMENSIONS.

	Feet.
Length on deck,	179
Breadth of beam moulded,	28.5
Breadth of beam extreme,	29.3
Depth of hold at midships,	11.5


STEAM TUG
LEVIATHAN.
8
4
D
D
H
M
Q
U
Y
C

First water line above base, 12 inches, all the others two feet apart.

Timbering room in forward body, is from frame dead flat to H, 2.33 feet; from H to M, 2.42 feet; from M to Q, 2.50 feet; from Q to U, 2 58 feet; from U to Y, 2.66 feet; from Y to h, 2.75 feet. Timbering room in after body is from frame dead flat to 8, 2.33 feet; from 8 to 12, 2.42 feet; from 12 to 16, 2.50 feet; from 16 to 20, 2.58 feet; from 20 to 24, 2.66 feet; from 24 to 33, 2.75 feet; from 33 to 34, 1.66 feet; height of cross seam, 13.50 feet; and distance aft of frame 34, is 13 inches. The keel at mid-length sides one foot; at the end 9 inches, and is moulded 14 inches. The stem-sides 9 inches, and the stern-post 9 at keel and 13 at deck. The rake of stern-post is 8 inches aft.

MOULD-LOFT TABLES OF THE STEAM-TUG "LEVIATHAN."

Frames.	Top Height.	First W.Line.	Second W.Line.	Third W.Line.	Fourth W.Line.	Fifth W.Line.	Sixth W.Line.	Top Breadth.
h	16.	—	—	—	.29	.45	.62	1.08
g	15.82	—	.30	.55	.75	1.—	1 31	1.95
e	15.44	.48	85	1.39	1.87	2.34	2 85	3.70
c	15.10	.87	1.70	2.54	3.21	3.85	4.46	5.42
Y	14.49	2.28	4.—	5.14	6.—	6.84	7.66	8.43
W	13.95	4.34	6.47	7.77	8.68	9 47	10.10	11.67
Q	13 52	6.44	8.77	10.02	10.88	11.47	11 95	12.28
M	13.19	8.30	10.50	11 13	12.29	12.75	13.07	13.27
H	12.90	9.46	11.60	12.56	13 08	13.66	13.77	13 89
D	12.67	10.—	12.14	13.—	13.52	13.94	14.08	14.17
Dead flat	12.54	10.10	12.33	13.21	13.70	14.—	14.19	14.25
4	12.43	9.77	12.19	13.06	13.35	13.92	14.10	14.12
8	12.40	9 23	11.71	12.72	13.27	13.71	13.81	13.85
12	12.42	8.17	10.70	11.94	12.65	13.14	13.39	13.45
16	12 58	6.44	9.04	10.56	11.57	12.23	12.66	12.95
20	12.79	4.40	6.79	8.50	9.85	10.92	11.59	12.03
24	13.10	2.46	4.27	5.90	7.42	8 83	10.—	10.90
28	13.50	1.04	1.98	2.98	4.14	5.58	7.30	9.22
30	13.75	.54	1.08	1.66	2.35	3.33	4.97	8.17
32	14.—	.33	.46	.58	.81	1.22	2.10	6.96
33	14.14	.27	.30	.32	.33	.42	.79	6.08
34	14.23	—	—	—	.21	.21	.35	.34
C.S.	14.27	—	—	—	—	—	—	4.65
Rake of stem from Frame....	10.83	3.46	6.37	8.—	9.52	10.17	10 58	

RAIL BREADTH ON FRAMES.

28	30	32	33	34	C. S.
Ft. 9.44	8.50	7.50	6.86	6.33	5.86

Round aft of cross seam is 13 inches. Round aft of rail is 1.21 feet.

The floors are solid fore and aft; frame moulded at the keel 13 inches; at the bilge, 9½ inches; at the top height, 6 inches. The keelson is sided 13 inches, and moulded 18 inches. The frame is diagonally strapped with iron plates 4 inches wide, and one-half inch thick, 5 feet apart. There are three bilge strakes of ceiling 7 inches thick; two strakes 6 inches; and two strakes 5 inches thick. Ceiling under clamps, 3 inches thick; and clamps

are 6 inches. The strings, or wales, at midships, are 5 inches thick, diminished to $3\frac{1}{2}$ inches at the wood ends, and are screw-bolted quite through the clamps. The bottom planks are 3 inches thick, increasing to 5 inches from the bilge to the strings. The garboard strakes are 5 inches thick. The planking is square fastened with treenails, and the ceiling with bolts in the same manner. The beams are of yellow pine, with knees under all outside, and under every third one inside. The planksheer is 5 inches thick, and the rail $3\frac{1}{2}$ inches.

Dimensions of Gallows Frame.—Size at wheel fore and aft, 20 inches; athwartships, 17 inches; size at head fore and aft, 17 inches; athwartships, 14 inches; height of frame from the throats of floors, 36 feet two and one-half inches.

Centre of weight of engines is located above frame dead flat; the centre of cylinders 3 feet abaft of centre of weight; the centre of working beam 11 ft. 9 inches abaft of centre of weight; the centre of shaft $20\frac{1}{2}$ ft. abaft of centre of weight; and the aft end of boilers $12\frac{1}{2}$ ft. forward of centre of weight. The engine keelsons are 48 feet long, 24 inches wide, and 3 ft. 10 inches deep, built ot 12-inch timber. The upper pieces are 35 feet long.

Engines.—Vertical beam; boilers, single return flues; diameter of cylinder, 60 inches; length of stroke, 10 feet; diameter of wheel, $29\frac{1}{2}$ feet; length of blades, 8 feet 4 inches; depth of do., 2 feet 4 inches; number of do., 21; number of boilers, 2; length of do., 28 feet; breadth of do., 10 feet; height of do., exclusive of steam-chests, 9 feet $10\frac{1}{2}$ inches; number of furnaces, 4; breadth of do., 4 feet 4 inches; length of fire-bars, 7 feet $7\frac{1}{2}$ inches; number of flues, 15 (10 below and 5 above); internal diameter of do., $12\frac{1}{4}$, 16, and 18 inches; length of do., below, 15 feet $5\frac{1}{2}$ inches; do. do., above, 21 feet 9 inches; diameter of chimney, 5 feet 5 inches; height of do., 64 feet 5 inches; heating surface, 2,927 square feet; pressure of steam, 40 pounds (maximum); area of immersed section at 8 feet draught, 176 square feet; fuel, anthracite, with a natural draught; contents of bunkers, in tons 30; consumption of coals per hour, 1 ton; draught of water even keel, about 8 feet; maximum revolutions, $22\frac{1}{2}$; masts, none; service, towing.

PERFORMANCE.—The following letter from Capt. Hazzard to Mr. Webb will speak for itself :—

NEW-YORK, May 8, 1855.

ECKFORD WEBB, Esq.,

Dear Sir,—You wished me to inform you of the particulars relating to some of the trials of speed of the steamer *Leviathan.* About the first is her running from Pier No. 1, N. R., New-York, down abreast of Quarantine—7 miles in 15 minutes—to the Buoy off West Bank, 13 miles in 29 minutes, and to the point of Sandy Hook—distance through the Swash Channel 20 miles—in 44 minutes. The first part of the time had 40 pounds of steam, wide open, making 22½ revolutions, and from West Bank down we had but 35 pounds, and three-fourths open, making 22 revolutions. The current in our favor may be set down as running four knots.

On another occasion, the *Leviathan* came up from the Light-Ship to Pier 4, N. R., in 64 minutes—distance 26 miles—with 40 pounds of steam, ports wide open—current in our favor three knots. At another time we came from Barnegat to the Highlands—43 miles—in two hours and three minutes. It was calm and very smooth, and there was no current—steam carried was 35 pounds, wide open, making 22 revolutions.

We have run from the Battery to the Bar a number of times in 54 and 56 minutes. Have also run from the Battery to Sand's Point—distance 23 miles—in 58 minutes; to Norwalk Light, 47 miles, in two hours and four minutes, (current in our favor so far at the rate of three knots,) to Stratford Light Boat, distance 68 miles, in 3 hours and 8 minutes; to Franklin Islands, 90 miles, in 4 hours and 20 minutes; to New London Light Boat, in 5 hours and 35 minutes; to Point Judah, in 7 hours and 20 minutes; passed the wharf at Newport in 8 hours and 5 minutes; and shut off steam at Warren River, R. I., on account of shoal water, after a run of 9 hours, having left New-York at 4½ P. M., and arrived at Warren Dock at 2 A. M. next morning, having spent half an hour in getting up to dock after reaching the shoal water. The entire distance is 185 miles, average per hour 21¾ miles; deducting for tide, the average is equal to 21 miles per hour.

On one other occasion, the *Leviathan* ran from New-York to Newburyport in 20 hours; remained there 1½ hours, and then left with the ship *Dreadnought,* 1,400 tons, in tow for New-York, and arrived at anchor in the East River in 37 hours, being gone from New-York only 58½ hours. The wind was light and ahead, and we came slowly over Nantucket Shoals in the night time, making the entire distance 780 miles; average speed running to Newburyport 19½ miles per hour; average speed towing the *Dreadnought* to New-York 10¼ miles per hour; average speed in going and returning, 13 and 7-10th miles per hour.

I think, after being coppered, with 40 pounds of steam, the *Leviathan* will run 23 miles per hour. On all the latter trials she had six days' coal

on board, drawing 9½ feet of water, whereas she draws but 7½ feet when light.

Yours, most respectfully,

CHAS. HAZZARD, 133 Monroe-street.

The *Leviathan* is owned by Messrs. Spofford, Tileston & Co., of New-York City, and does credit to their enterprise and spirit for bringing out the finest tug-boat in the world.

WHAT THE UNITED STATES NAVY WOULD BE IF ADAPTED TO THE AGE.

(*Continued from page* 115.)

BUT if the commerce of this vast extent of sea-coast of over 5,000 miles, and of inland navigation of more than double that amount, can be adapted to the waters they are required to navigate, should not the government vessels be able to do the same kind of service? Are not those very *bars* and *shoals*, of which many of our friends complain, the very best defence against an enemy they could have, with such deep ships as foreign nations now have? Are they not so many Cronstadts without the fortress? Why is New-York and Boston so much exposed to an enemy? Simply because of their accessible waters. Is it in accordance, then, with the laws of common sense, to build a navy of large ships which can only enter three ports of its own territory, and that territory the best watered on the globe? We have one large ship in the Navy, and that is enough; let her be kept to look at and talk about, and if it were not for the national mortification of losing her, the government might keep her to send our ministers abroad, as it seems to be in accordance with the republicanism of some of our legislators that *large men* must be sent abroad in *large ships*. One may understand by this, that *large ideas* cannot be contained in *small vessels*. A minister to a foreign country, it is thought by some, would not be respected unless he went out in a government vessel of the largest class. Well, if this is so, let the Pennsylvania be kept, and the foreign ministers be sent out in her under a convoy of smaller ships, not to protect her from an

enemy, but from herself; for she has more to dread from herself than from an enemy. But is it because she is so large that she is unsafe? We say no; there are larger as well as safer vessels in the merchant service. This kind of policy in *aping* the aristocracy of the Old World is too ridiculous to be entertained by sensible men. We have been dancing attendance to the Old World long enough; our naval officers have been sent abroad to seek improvements in the British navy, which has been regarded as the model, and we have been wont to imitate, until we have, for the most part, a navy like that of England, *inefficient, and not adapted to the wants of the age.* We are so apt to learn what everybody else is about before we learn what is doing at home. While England comes here to obtain improvements, we go there to get the stamp of Royalty upon them before we dare to use them, and yet we are republicans—independent. There are many who would challenge a man for a duel were he to insinuate that it was not so. Have we not been of late years in some respects, particularly in naval affairs, as much under the *stamp act* as we ever were? The wisdom of experience teaches that little ships and great guns are best for war. Our *great legislators say great ships, great men, and small guns are best.* We must follow England. She leaves her largest ships at home this time, and sends her small ones out; but the reason why she does so, is because they draw too much water. The reason why we leave ours home, is because we cannot get *seamen.*

With regard to draught of water, we may remark, substantially, that so far as adaptation to the wants of commerce, there is not a port of entry in the United States having seven feet of water on the bar or shoals, but may enjoy the trade consequent upon the entering and clearing of vessels of five hundred tons, and direct trade with Europe if they desire it, and use the proper means to obtain it. The idea of deepening all the ports of entry for vessels of heavy draught of water, to be at once filled up again, is absurd. The trade of the Upper Lakes in vessels of over 600 tons, is carried on extensively with less than 10 feet water at times; and we speak understandingly, when we say that direct trade with Europe may be had in vessels of 300 tons drawing not more

than six feet water if properly constructed—not so profitable as in large vessels, of course, but as to safety and efficiency, equally so. Even so with the Navy; the greatest rate of speed may be obtained on 7 feet draught of water, and the heaviest gun in the Navy may be worked efficiently and with safety to vessel and men, and we speak understandingly on this point also.

The cause of many of the misfortunes in the Navy of the United States may be set down as consequent upon the heterogeneous mode of admeasurement, and notwithstanding government may have nothing to gain by an improper mode of determining the tonnage of its vessels, the reacting influence of private enterprise holds the government counsel with a powerful grasp. We say that proportions somewhat similar to those of our single deck coasting-vessels, but with a greater proportion of length and breadth, is what is required by both the government and revenue service. The revenue cutters draw about ten feet of water, and can go within from 5 to 7 miles only of many parts of the Southern coast; hence it is quite possible for apparent shipments of large quantities of sugar and molasses to be made from certain Southern districts, far exceeding the actual quantity that is manufactured in those portions of the country. We believe it is practicable for a schooner of light draught to sail from the United States to some port in the West Indies, discharge cargo, take on board two or three hundred hogsheads of sugar or molasses, and clear for New-York, or any other port in this country, but proceed first to some one of our sugar districts, where, lying in beyond the eye and reach of our revenue vessels, she may receive the balance of her cargo, and when ready for sea, clear the entire cargo for the port of destination. We have no doubt that shipments of four hundred hogsheads of sugar are made from plantations which can raise scarcely two hundred; whether the other two hundred hogsheads came from Havana or elsewhere, the officers of the revenue service cannot tell; and why? Simply because our revenue vessels draw too much water to go in and see what is going on in shore. Then we say, make our revenue vessels, as well as those of the Navy, longer, wider, and shoaler, with a slide keel, to increase

the lateral resistance; and to give them longitudinal strength, give them an iron keelson, which may be used as a water tank; and with the addition of two transverse bulkheads, we might also have the life-boat principle. And we may add, that there is one striking fact connected with this life-boat principle that may be said of almost every great improvement—it brings other advantages with it, viz: increased strength as well as increased capacity and safety, in addition to the light draught of water. A war vessel may be built 200 feet long, 50 feet wide, and 10 feet deep, with but 7 feet draught of water, as will be seen in our next issue.

(*To be continued.*)

ON THE COLLIERS OF ENGLAND.

On the 27th of February last, a profound disquisition on the subject of "Steam and Sailing Colliers," was read at the Institution of Civil Engineers, London, by Mr. E. E. Allen. Of all the papers we have ever read upon maritime economy, this one is the most remarkable for its conclusions. The first part of it was devoted to an analysis of the working expenses of "Steam and Sailing Colliers," whence it was concluded, "that the steam colliers carried about double the average cargoes of sailing colliers, and were capable of making three times the number of voyages per annum; one screw collier being, therefore, equal in capacity to six sailing colliers." "Statistics," "tables," and calculations were given to prove that a saving of 33 per cent. could be effected in the transportation of coals from Newcastle to London by the exclusive employment of steam colliers! Pretty well for an association of *engineers*. "Nothing like leather." It must be a strange kind of model which is used as sailing colliers in England, if one screw vessel going at the prescribed rate of "full *seven* knots," can do the work of *six* sailing vessels! There is no such disparity in the United States between steam and sailing vessels in any trade, nor need there be in England. Perhaps we will get an idea of the secret, when we understand that "good wooden vessels suitable for colliers,

are always to be bought for £1,200 to £1,800, and iron screw colliers, in ordinary times, at £9,000 to £10,000," so that the first cost of *six* sailing colliers and *one* screw collier might be set down as about equal. It was also shown that the working expenses of the single screw collier was five-sixths of that estimated for the six sailing vessels. It will be seen that the sailing colliers were to consist of old vessels, the shells of the 17th century, which are still drifting about from one port to another on the coast of England, whilst the screw collier is to be a modern built iron propeller. A discriminate piece of *engineering,* this! Why not place both kinds of vessel on an equal footing in respect to capacity and model?

But the most interesting part of the paper, discussed at considerable length the various modes of *ballasting* now in use, with a view to determine the most eligible one. We will enumerate the *scientific* classification of the different modes:—First, "ordinary sand-ballast; bag-water ballast; bottom-water ballast; hold-water ballast; and tank-water ballast." The three first only are as yet employed in colliers, and the fourth has been introduced by Scott Russell. It was shown that "vessels took about one-sixth of their average cargoes in *ballast,* at an annual cost of $5 to $7 per ton. The bag-water ballast invented by a *Doctor,* (of physic, we suppose,) and the bottom-water ballast devised by Mr. Russell, was thought to present about equal claims to superiority for the purpose of furnishing *stability.* The doctor's mode of curing instability consists in arranging bags on the floor of the vessel, connected by a canvas hose communicating through the side of the vessel by a large stopcock with the external water, which ran in and filled them when required. In discharging them, the water was let into the hold, and then pumped out, either by the common ship's pumps, or by a pump for that purpose which delivered the water above the level of the fluid outside.

Bottom-water ballast was described as the method of adding a second, or false floor, or ceiling above the first, to iron vessels, and filling the intermediate space with water; the first cost of this magnificent arrangement to compensate for an injudicious choice of dimensions and model, was stated to be about $10 per

ton, which for vessels carrying 600 tons of cargo, would amount to $30 per ton of ballast, assuming that she would require 100 tons.

We think this is paying rather dearly for the gratification of a cherished prejudice, or the practical illustration of an absurd theory. We announce it as an axiom, that vessels, if built of proper proportions in dimensions and model, and are rigged as they should be, *require no ballast.* The stability of a vessel is a problem belonging to the ship-builder to solve, which, if he is incapable of doing, reflects no credit upon his science. Instability is a matter to be prevented, and not to be cured by the *injections* of an "M. D." We have coasting vessels in this country that require no ballast when without cargo, and why not build a few in England to compete with screw vessels.

If the experiment were fairly tried, we think it would clearly appear, that what could not be done by the "keels," or coal boxes of the 17th century, might be accomplished by the schooners of the New World.

It was not only decided that screw vessels were the most eligible description of colliers along the coast of England, but that they offered many advantages over every other kind of craft for coaling the stations for steamers between England and the East Indies, or Australia. And it was also determined by calculations, that a great saving would be made in establishing way-stations for coaling, on such routes; and nothing but an extraordinary depreciation of coal freights could ever justify coaling entirely in England.

The annual coal product of England was now stated to be about 35,000,000 tons, and the quantity exported equal to 8 per cent. of this quantity. The total areas of the coal fields in the United Kingdom, is estimated at nearly 8,000 square miles.

REMARKABLE PASSAGE.—The new ship 'Cavalier,' of Rockland, Me., Capt. J. W. Glover, which sailed from Rockland, January 1, at noon, arrived at the Levee at New-Orleans on the 11th inst., having made the passage in 10 days. This is believed to be as short as any previous passage between those ports, if not the shortest. The 'Cavalier' is 1,300 tons burthen, is not a clipper-built ship, but of a full model of modern style, intended to unite, in as great a degree as possible, the qualities of carrying a large cargo and of sailing fast.

THE CLIPPER SHIP "FLYING SCUD."

Among the annular periods of the late era of clipper-ship building, perhaps the year 1853 was the most remarkable for the number, beauty, and fleetness of its vessels. It was, most certainly, quite as distinguished for perfective modelling as the past year has been for the mongrel practice of constructing clipper tops upon "full" bottoms.

During the year 1853, there was scarce a builder in the most distant part of the Union, who did not launch his favorite clipper *beau ideal;* nor was there an owner who did not gain possession of the "finest" vessel in market; while the shipmaster grew equally proud of the splendid qualities which he was called to command at sea.

The genius of progressive art taxed its powers to the utmost in reaching for perfection. The spirit of observation was clear and keen, and all laudable efforts were made to secure the advantage of a broad and penetrating view of the secrets of modelling. It was equally interesting to observe the peregrinations of curiosity seeking for more light on the complex mysteries of ship-building, as to witness the contracting scintillations of conceit, which puzzled itself in concealing its rays from the vision of strangers. Models were anxiously sought for inspection, and quite as anxiously kept from view. Yet all this did not check the realization of splendid specimens of marine architecture, even by those who had not yet become famous for ship-building. The efforts of unassisted genius were often far more successful than the aided copyist who knew no obstructions to his goal.

Perfection in ship-building became, as it ought ever to be, a task for brains and hands; and wherever these were found on a platform of capital, the builders' claim to honors were fully vindicated. Under such circumstances, the modest ship-yard of the obscure village was often found taking its position at the head of the column to the astonishment of some, who had hitherto enjoyed the glare, but not the genial beams of daylight. In other words, we learned that genius had no royal dwelling-place in America.

These remarks have not presented themselves on this occa-

sion only. We have witnessed what we have attempted to portray, and now feel in the mood to advert to this instructive phase of experience.

Through the politeness of her builders, we are enabled to give place to the following description of the "Flying Scud," which has proved herself one of the finest, fastest, and strongest sailers out of the port of New-York. The model of this vessel does ample credit to the joint skill of her builders, while the spar and sail draught is due to Mr. Metcalf alone. She was built for a market in a superior and most faithful manner, and is now owned by Amos Howes & Co., of New-York.

The clipper-ship "Flying Scud" was built at Damariscotta, Maine, by Messrs. Metcalf & Norris, and launched November 3, 1853:

DESCRIPTION:

Length on deck	221 feet.
Breadth of beam	41 "
Depth of hold	23 feet 9 inches.

Measurement—1713 tons register. She has 22 inches dead rise, and one foot swell on a side.

Frame—Virginia white oak entire.

Keel—209 feet long, 16 by 33 inches, of white oak, in four pieces.

Floors—Sided 14 inches, 17 inches in breach, tapers to 7 inches at the upper deck; lower futtocks, 11 feet long.

Keelsons—In four parts, two of them 16 by 16 inch square; one 15 by 15 inches; one 12 by 15 inches; all of white oak, very long pieces.

Sister Keelsons—16 inches deep, bolted to keelsons and naval timbers.

Ceiling—Floor of white oak, balance of hard pine.

Bilge—Commencing at floor timber heads, with bilge keelson 13 by 15 inches, diminishing one inch in each streak to 8 inches, which is the thickness of balance to lower deck, all well fitted and bevelled, and fastened with four bolts to each frame of one inch iron, heated and headed by the blacksmith, and drove through the timbers; bilge keelson, bolted with 1 1-8 inch iron, drove through and riveted.

Lower Deck Beams—Of hard pine, 16 by 16 inches.

Upper Deck Beams—Of hard pine, 15 by 10 inches.

Lower Stringers—Of hard pine, 16 by 16 inches, scarphed and bolted, with 1 1-4 inch iron, three bolts to each frame.

Lock Strakes—In lower deck, 10 by 12 inches, bolted through beams and stringers and ship's side; two strakes on stringers, 11 by 10 inches; edge bolted through main stringers, ceiled from those strakes to the deck with 6

inch stuff, fastened with 4 bolts to each frame, one-half of which is drove from outside, and riveted.

Low eck Plank—Of clear hard pine.

Upper Deck Plank—Of clear white pine, 3½ inches thick.

Hanging Knees—Between decks, 12 to 10½ inches, moulded 21 inches at throat, all of hackmatack, fastened with 28 bolts in each, drove through and riveted.

Hanging Knees—In lower hold, of white oak, sided 12 to 14 inches; moulded 24 inches, and fastened with 32 bolts, 1¼ inch iron in the throat, all drove through and riveted.

Lodging Knees—In lower deck, sided 8½ inches, and moulded 15 inches.

Lodging Knees—In upper deck, sided 6½ inches, and moulded 13 inches, all of hackmatack, fastened with a bolt to every timber, and five to each arm, and thirteen to fifteen to each berth.

Out-Board Plank—Of white oak, with the exception of floor, which is of hard pine, all very long and handsome plank, 4½ inches; wales 6 inches thick, all white oak.

Thick Garboard—Two strakes well bolted to keel, floor, and naval timbers.

Water Ways—Of white pine, 12 by 14 inches.

Plank Shear—Of white pine, 6 inches thick.

Rail—Hard pine, 6 by 15; monkey rail, white oak, 4½ by 8½ inches; main rail, 46 inches high, the stancheons extending up to monkey rail, which is 15 inches high.

Masts—Are made of extra long stuff, running the whole length, of hard pine.

She has a top-gallant fore-castle, with water closets adjoining, a large house amid-ships, containing two separate apartments for the crew; galley, store rooms, &c. A half poop-deck, with trunk fitted into it, containing two spacious cabins, the after one of mahogany and other fancy woods, has recess sofas on each side; state rooms, &c., and gangway leading out aft; the forward cabin divided into state rooms, pantry, &c. Her ends are long and sharp; her anterior lines are slightly hollow, but gradually merge into the convex near the rail. The bow is ornamented with a full figure of a unique female. The stern is of the elliptical, or half round form, ornamented with gilded wreaths. The bow being very lean, gives the stern a light and faultless appearance. It is also ornamented with gilded wreaths, and the American Eagle in the centre.

MASTS AND SPARS SHIP "FLYING SCUD."

MASTS.

	Length. Feet.	Diameter. Inches.	Mast-Head. Feet.
Fore-mast	82	35	14
Top-mast	48	18	9
Top-gallant-mast	26	13	0

	Length. Feet.	Diameter Inches.	Mast Head. Feet.
Royal-mast	17	0	0
Skysail-mast	10		pole 6
Main-mast	86	36	15
Top-mast	50	18	9½
Top-gallant-mast	28	13½	0
Royal-mast	19	0	0
Skysail-mast	12		pole 7
Mizzen-mast	78	27	13
Top-mast	39	14½	8½
Top-gallant-mast	22	10	0
Royal-mast	14½	0	0
Skysail-mast	9		pole 5
YARDS.			YARD-ARMS.
Fore-yard	76	22	4½
Top-sail	61	17½	4
Top-gallant	47	10½	3
Royal	36	9	2
Sky-sail	28	7½	1½
Main-yard	82	23	4½
Top-sail	67	18	4
Top-gallant	53	12	3½
Royal	40	10	2½
Sky-sail	32	8½	1½
Mizzen-yard	62	17	4
Top-sail	48	12½	3½
Top-gallant	35	9½	2
Sky-sail	20	6	1½

SPARS CONTINUED.

Bowsprit, out-board..........19 feet....Diameter, 34 inches.
Jib-boom.........18—14 ... 5 do end ....18 do.
Spanker-boom.....................58 feet long.
" gaff.......................40 " "
Spencer " ....24 " "

Passage to Australia.—Through the courtesy of her owners, Messrs. Howes & Co., we are furnished with the following copy of Capt. Bearce's letter, respecting his late passage from New-York to Melbourne. It will be seen that his account of the length of voyage differs from another given by the Surgeon of the ship, as shown by a letter from a correspondent at Bos-

ton, in another article. We also append an extract from a letter written by the consignees, Messrs. Hussey, Bond & Hale, at Melbourne, fixing the date of the arrival of the "Flying Scud" at "the Heads" two days before she reached anchorage. It would appear that the time of passage is between 76 and 79 days, but we wait for more light to determine where.

(Copy.)

"MELBOURNE, *January* 8, 1855.

"MESSRS. HOWES & Co., New-York.—*Gentlemen*:—This will inform you of the ship Flying Scud's safe arrival at this port, after a passage of 75 days, all well. The ship was quite crank when we first left. The ship has made much better weather of it than I expected she would. She is a first-rate sea-boat, and as for her sailing qualities, I think she will go well. Second day from New-York, in the Gulf Stream, shipped a sea; it took one man over the lee-rail, and about one quarter of our deck load. Was obliged to shorten sail to save the deck load of provisions. At 8 P. M. same evening, was struck with lightning; it knocked every one down that was on deck, but done the ship no injury. But, strange to say, it had a powerful effect on the compasses; they all going around like a whiz-buz for 12 hours. We made a binnacle eight feet high, and put the compasses in that—when they became steady, but was from 3 to 5 points out of the way, and have been so all the passage, varying first one way, then another. At the time the lightning struck the ship, she was going 13 knots, wind from the west thick and squally. We were obliged to clue our top-sails down, not having any compass to steer by, and bring the ship to the wind. At 11 A. M., Oct. 1st, after laying-to 17 hours, saw the sun; kept off on our course as near as we could, till at 7 P. M. same evening, got the bearings of the polar star; found the compasses five points out of the way—they have been a sore trial to me this passage, for I could put no confidence in them, they constantly varying. We have lost more miles by the compasses being out of the way than we have by the ship being out of trim, and both put together makes quite an item in our passage. The Flying Scud has made the quickest passage that has ever been made from the States to this port. We beat the ship Flying Dutchman seven days.

"Gentlemen, I remain your obedient servant,

"W. H. BEARSE."

Extract from Hussey, Bond & Hale's Letter.

"The 'Scud' is a noble clipper, and made one of the quickest runs out on record, having arrived at the Heads on Thursday 14th, and anchored in Hobson's Bay on Saturday, 16th December."

THE PRESENT CONDITION OF MARINE ART.

The idea which from time immemorial has been heralded abroad in every land, where the tide wave washes its shores, and where commerce is regarded as the engine of civilization, that ship-building has attained the altitude of a perfected art, is idle and ill-grounded. Let all who entertain such absurd notions, remember and hold us accountable for the truth of the expression—that *ship-building is but in its infancy.* The stream of mechanical knowledge, from which such minds are irrigated, must be shallow indeed. We say, and without fear of successful contradiction, that the art of ship-building will be the last in the catalogue to approximate perfection, for a variety of reasons, and perhaps there are none more prominent than that which admonishes us, that the ablest marine architects in the world, have only arrived at a position, in which they can *begin* to study *nature's laws* to *advantage;* and inasmuch as the fact is too familiar to every mechanical mind, to be for a moment questioned, that no man can work without tools, so it is equally true, that no man can work successfully without a knowledge of their use. What, we inquire, does the ship-builders, ship-masters, or ship-owners, know of the elements the ship is designed to navigate? The wisest have only began to study their laws, and measure their force. Who has discovered a shape or form for vessels, which, if it were increased or diminished in size or proportions, would not be improved? We boast of steam as a motive power for propelling vessels, and yet our sailing vessels surpass steamers in speed; we boast of the majesty and strength of our sailing ships, and yet the slightest casualty will cause the passengers and crews to leave her, and prefer the open boat in mid-ocean, in many respects but little better than the *corracle* of Britain, *hundreds of years ago.*

Away, then, with the idea of perfected art in ship-building. Let us look about among the multiplicity of things to be done; let us see which should be done first, rather than spend our time in endeavoring to persuade ourselves that all has been done—

that the ship is just the thing of life which no man may improve. We would advise the man who entertains such contracted views of nautical science, if he be a ship-builder, to learn another trade, or to adopt another calling at once, before he finds himself, some fine day, too high up on the beach ever to be made available for any purpose whatever.

FOGYISM AT CONFESSION.

We did not suppose, when we unfurled our banners, and opened fire from the bulwarks of truth, not in the Crimea, but in the Nautical Magazine, against the prejudices of the age in Maritime Mechanism, rendered still more formidable by numbers, means, and influence, than Sevastapol itself, that in less time than it has required the allies to destroy that fortress, we should have made an impression on any of the strongholds of prejudice in Nautical Mechanism.

In conversation, a few days since, with a friend, who prides himself in the stock of foresight he keeps in store, ready for use for any contingency, in commercial operations, among other topics discussed, was that of the probabilities attending the success of the steamer Ocean Bird, alias the Six Day Steamer, now very nearly ready for sea; and while he advocated the advantages of her present arrangement for the accommodation of an increased number of passengers, causing an increased draught of water, with diminished speed and stability, we advocated the original design, as best adapted to furnish remunerative profits; and while we insisted that had the vessel been finished as originally designed, and armed with two 11 inch pivot guns, she would not only have performed the voyage as intended, but the owner could have readily sold her at his own price, if he chose to do so, to the allies; to our surprise, before we had time to finish the argument, and show the deleterious influence of 189 tons of top hamper on the sea qualities of a vessel, and which would have paid better, either in coal or freight, he admitted that we were correct, and thus assented,

that commercially and financially, as well as mechanically, we were right. And now, by way of admonition to the proprietors of the Collins, Vanderbilt, and last, if not least, to the McKay lines of steamers, if they would secure a line of steamers that will *pay*, and compel the Cunard line to withdraw, let them take counsel before they build, while they may, without being compelled, of necessity, to take lessons in the school of bitter experience, severely bought and dearly paid for, as others have done.

PRUSSIAN CUSTOM-HOUSE MEASUREMENT.

Length—Measure from outside plank, on stem, to prolongation of outside plank, at post, on deck.

Breadth—Measure the greatest breadth on outside plank in the wales.

Depth—Measure from top of garboard plank to top of deck plank in the main hatch.

The computation for tonnage is based upon a rule which is worked out from a large number of vessels of known carrying capacity. This rule works as follows:

Take $\frac{1}{12}$ of length, as given above, set it off from the forward end of length, and from the aft end; at these spots measure the greatest breadth at the wales, on outside plank; add these two breadths (on forward and aft $\frac{1}{12}$ of length) together, and divide it by 2. This measure subtract from the greatest breadth, as ascertained above. For the remaining difference, you find in the tables under the head of the greatest breadth of the vessel, a certain multiplicator. All that remains to be done now, is to multiply the three principal dimensions together, multiply with the last found multiplicator, and divide by 1,000. The result is, the number of tons (lasts) the vessel is expected to carry.

This rule for tonnage is defective, because those vessels from which it is inferred, are a certain set of vessels; for them it works well enough, but badly for any shape which deviates.

The Prussian foot = 1.029722 of the United States.

THE STEAMBOAT COMMONWEALTH.

In commencing a series of articles descriptive of the present altitude of Steamboat Architecture in the United States, it may not be improper to remark, that it has been left almost entirely to the travelling community of this extended country to inaugurate and mature the unrivaled splendor and comfort of steamboat transit, and that, too, on a scale commensurate only with the interminable extent of our navigable waters, and the prosperity and freedom of our people. Europe may be said to have as yet no practical knowledge of the delightful mode of water travelling which may be enjoyed by all classes of our citizens in the spacious saloons of our steam-driven palaces, redolent of art and beauty. Nor is it less true that the steamboats, as well as the sailing ships of a nation, represent not only the genius, taste, and skill of its people, but their enterprise, power, and activity in every legitimate field of thought and action. And this principle is quite as pertinent in its application to individuals.

Among the many splendid examples of Steamboat Architecture to be found in the waters of the New World from which we might select one for the subject of an article at the present time, the Commonwealth presents herself as one of the most striking and interesting in every point of quality and degree of perfection, which is now established as the standard of excellence in this department of marine art. The steamboat Commonwealth has been constructed with direct reference to completeness and elegance in every particular; and is not excelled in beauty and magnificence by any passage steamer upon American waters. The designs of her public-spirited proprietors have been fully and satisfactorily accomplished; and while they may well be proud of the results of their extravagant expenditures, they may also congratulate themselves upon the wisdom of the course which they adopted to attain their object. It happens quite too frequently in the history of marine construction, that proprietors, although incompetent *amateurs*, nevertheless become ambitious to direct mechanical operations, without venturing to assume the entire responsibility for conse-

quent blunders; thus crippling the genius of architects, builders and engineers, who ought rather to be left free to preside with absolute authority over the functions of their respective departments. It has not been the misfortune of the proprietors of the Commonwealth to fall into this error. They have exercised the rare good sense to remain in the financial province, leaving to mechanics the execution of mechanical things. For this they deserve a fair proportion of the praise which it is natural for an approving public to bestow upon a deserving specimen of art.

The hull of the Commonwealth was modelled and built in 1854, by Messrs. LAWRENCE & FOULKS, at Williamsburgh, New-York, by whose courteous permission we have been enabled to present our readers with a copy of the mould-loft tables, with this article. Their model was adopted without any alteration, and is worthy of examination by all professional architects. We regard it as one of the very best which has been adapted to the steam navigation of Long Island Sound, having adequate stability, ease of motion, and every other good sea quality. The keel forward rises above a straight line, and blends into the stem by an easy curve; the greatest transverse section is 7 feet abaft of mid-length of load-line; and the fore and aft portions of the mid-ship body are duplicates of each other for a length of 56 feet. This is an original feature in steamboat modeling. The bow has a sharp angle of resistance, and is quite lifting to the fluid. The run is very clean. The vertical section lines are quite easy, as we think they should be, either for sea-going steamers or sailing vessels. We are particularly pleased with the liberality of *breadth*, furnishing, as it does, not only *stability* and steadiness, but ample space for accommodations.]

DIMENSIONS.

Length over all on deck	316 feet.
Length on the load-line	300 "
Breadth of beam moulded	41 "
Breadth of beam extreme	42 "
Breadth over guards	77 "
Depth of hold	13 " 6 in.
Tonnage for Register	1732 tons.
Draft of water in running trim	8 feet.

MOULD LOFT TABLES OF THE STEAMBOAT COMMONWEALTH.

Frames.	Top Height. ft.	First W.Line. ft.	Second W.Line. ft.	Third W.Line. ft.	Fourth W.Line. ft.	Fifth W.Line. ft.	Sixth W.Line. ft.	Seventh W.Line. ft.	Top Br'dth. ft.
Stem	17.33	—	—	—	—	—	—	—	—
50	17.17	—	—	—	0.61	.89	1.17	1 35	1.11
46	16 94	—	0 79	1 71	1.79	2.27	2.36	3.22	4.46
42	16.69	.62	1.63	2.46	3 14	3 81	4.50	5.24	6.84
38	16.47	1.15	2 63	3.70	4.58	5.39	6.22	7.11	8.98
34	16 27	1.79	3 77	5 05	6.07	7.—	7.93	8.87	10.89
30	16.07	2 62	4 98	6.43	7.57	8.60	9.62	10.72	12.60
26	15.86	3.56	6 21	7.81	9 08	10.19	11.25	12.35	14.09
22	15.67	4 52	7.43	9.20	10.51	11.68	12.81	13.85	15.31
18	15.50	5.53	8.72	10.52	11.99	13.13	14.17	15.12	16.32
14	15.33	6.53	9.98	11.86	13.29	14.42	15.36	16.23	17.13
10	15.18	7 54	11.21	13.13	14.51	15.55	16.44	17.17	17.76
6	15.02	7.92	12,35	14.27	15.62	16.75	17.53	17.76	17.83
2	14.92	9.58	13.—	15.18	16.25	17.08	18.59	18.92	18.92
Y	14.78	10.17	13.93	15.83	16.67	17.44	19.09	19.25	19.25
U	14.67	11.—	14 58	16.01	17.08	18.01	19.50	19 58	19.58
Q	14.57	12.08	16.93	17.50	17·93	18.60	19.83	19.84	19.84
M	14.49	13.92	17.59	18.—	18 34	19.17	19.92	19.92	19.92
H	14.40	16 02	17 83	18.92	19.09	19.51	20.18	20.26	20 26
D	14.33	16.58	18.01	19.26	19-83	20 18	20.33	20 33	20.33
Dead flat	14.33	16.92	18.34	19.62	20.21	20.44	20.50	20.50	20.50
4	14.31	16.58	18.01	19 26	19.81	20.18	20.33	20.33	30.33
8	14.30	16.02	17.83	18.92	19.09	19.51	20.18	20.26	20.26
12	14.28	13.92	17.59	18.—	18.34	19.17	19 92	19.92	19.92
16	14.26	12.08	16.93	17.50	17.93	18 60	19.83	19.84	19 84
20	14.24	11.—	14.58	16.01	17.08	18.01	19.50	19.58	19.58
24	14.25	10.18	13.93	15.83	16.67	17.44	19.09	19.25	19.25
28	14.28	9.09	13.—	15.18	16.25	17.08	18.59	18 92	18.92
32	14.33	8.72	12.37	14.35	15 79	16.86	17 53	17.76	17 81
36	14.38	7.65	11.26	13 18	14.77	16.17	16.86	17.17	17.22
40	14.48	6.58	10.—	11.95	13.59	15 04	16.08	16.46	16.53
44	14 57	5.30	8.68	10.55	12 25	13.89	15.15	15.66	15.75
48	14.65	4.37	7.18	9.—	10.72	12·57	14.15	14.76	14.89
52	14.76	3.58	5.76	7.33	9.07	11 11	13.02	13 68	13.98
56	14.86	2.17	4.31	5.71	7.27	9 37	11.76	12.85	13.—
60	14.99	1.26	2·93	3.97	5.29	7.25	10 25	11.75	11.96
64	15.10	—.85	1.72	2.40	3.20	4.61	8.12	10.50	10.84
68	15 24	—	0.76	1.06	1.39	1.87	3.66	8 96	9.65
70	15.31	—	—	—.52	0 63	0.75	1.12	7.90	9.04
Transom	15.33							6.66 ft.	8.66

The Water Lines are two feet apart. Frames two feet apart.

The rise of margin of keel on frame, 36,= 0.8 ft.; on 38, one inch; on 40, 0.23 ft.; on 42, 0.45 ft.; on 44, 0.78 ft.; on 46, 1.29 ft.; on 48, 2.18 ft; on .50, 4.07 ft.; frame 50 is 5.04 feet abaft the stem at top height. The keel is sided 14 inches, and from frame 31, forward diminishes to 10½ inches at frame 46; from frame 59 aft it also tapers to 11½ inches at the stern post.

The height of cross seam above base at centre................12.42 feet.
Height of cross seam at 1st section line=12.56; out from centre, 2.50 "
" " 2nd sec., 12.79...... " 1st sec., 2.56 "
" " 3rd " =13.21...... " 2nd sec., 2.56 "
" " top height......................=15.33 "

The stern post is 20 inches abaft of frame, 70 at the keel, and 2.33 feet at the cross seam.

The frame of the COMMONWEALTH is sided 7 inches, being moulded 20 inches at the keel and 6 inches at the top height, diminished between these points in straight lines. The thickness of ceiling is $2\frac{1}{2}$ inches, with eight bilge strakes 6 inches in thickness, diminished to 6 inches at fore and aft ends. The clamps are worked in two strakes $4\frac{1}{2}$ inches thick. The strings, or wales, are 5 inches in thickness, and eight strakes below the strings are 4 inches; and thence to below the turn of the bilge the plank are $3\frac{1}{2}$ inches; and those on the bottom are 3 inches—all of oak. The frame is diagonally strapped in a thorough manner, with iron straps, 4 by $\frac{5}{8}$ inches thick.

The engine of the Commonwealth was built by the MORGAN IRON WORKS, New-York, and except in the perfection of the work, there is nothing peculiar in its construction. The builders have kindly furnished us with the particulars, as follows:—

ENGINE.—Vertical beam variety.

Diameter of cylinder	76 inches.
Length of stroke	12 feet.
Length of beam between centres	26 "
Length of connecting rod	24 "
Average pressure of steam in pounds	30
Diameter of steam-pipe	28 inches.
Cut-off—Stevens—at an average of	7 feet.
Revolutions per minute, with average pressure	19

BOILERS.—Two, return flued, placed forward of engine.

Length of boilers	38 ft.
Breadth "	13 " 6 in.
Diameter of shell	11 "
Height of shell (exclusive of steam chimney)	12 " 6 in.
Number of furnaces in all	6
Breadth " "	4 ft. 2 in.
Length of grate bars	8 "

Number of flues, 10 main and 6 return.
Internal diameter of flues, 18, 16, and 13 inches.
Heating surface (fire and flues) 5,000 sq. ft.

Diameter of smoke pipes	56 inches.
Height of smoke pipes	40 feet.

Description of coal—Anthracite.
Draft—Blowing engines and blowers.

PADDLE WHEELS.—Of wood.

Diameter	38 feet.
Length of blades	10 " 6 in.
Depth	32 inches.
Number	28
Draught of water with boiler filled, and 40 tons of coal on board	8 ft. 4 in.
Immersion of buckets at that draught	3 " 4 "

Engine fitted with E. W. Smith's safety unhooking gear, by which the steam eccentric is unhooked instantly, when, by breakage of any of the parts, the piston moves one half inch beyond the limits prescribed by the cranks.

CABINS AND ARRANGEMENTS.—For whatever of excellence the "Commonwealth" has in the plans, designs and arrangement of her cabins, she is indebted to Mr. Alex. Hawkins, Marine Architect, who had the general supervision and the entire planning of all the work. His drafts were made before any work was done, and what is peculiar, and almost unprecedented, no alterations were made during the progress of the work, which for design and finish is not surpassed by any steamer out of the port of New-York. The upper cabin, or saloon deck, runs the entire length of the boat, in a manner similar to the steamboats on the Lakes, and is about 9 feet in height above the main deck. Above the saloon a splendid semi-circular dome, original in design, extends the entire length, and thus elevates the ceiling near 15 feet above the saloon deck. We would refer to the illustration for the external appearance of this beautiful steamer. The "Commonwealth" contains 120 state-rooms, with two berths to each, located upon the second deck, and has ample accommodations for 600 cabin passengers. The lower cabin under the main deck is very commodious; and the forward part is appropriated as a dining-saloon; while on the main deck, abaft the gangway, a spacious and splendid ladies' cabin, unsurpassed in style and finish, is constructed. A fine cabin is also set off from the main upper saloon, on the after end of the boat, which contains 30 large sofas, enabling passengers to sit and enjoy the magnificent prospect of the evening passage on the Sound with comfort. The greatest care and skill has been

manifested in ventilating every state-room, cabin, and saloon throughout the boat. There are several bridal-chambers and 18 large state-rooms, gorgeously furnished with upholstery; all the state-rooms are so arranged as to admit of a direct and easy escape to the outside of the boat, in case of accident. The main stair-case, situated abaft the engine-room, runs with double flights from the lower cabin to the upper saloon, with double entrances to both decks. The stairway is a beautiful, and self-supporting structure, and one of the finest pieces of workmanship which we have seen. The Captain and pilot's rooms are in the rear of the wheelhouse, from which a speaking-trumpet extends, which can also be sounded as a whistle to the forecastle. Twelve bells are placed in different localities of the boat to enable the Captain to communicate with the engineer in every situation. The ground tackle consists of 3 common and 1 very large-sized anchor, to be worked with improved purchase. The "Commonwealth" has 600 pairs of life-preservers, eight life-boats, and 155 life-preserving seats.

Mr. Samuel Carter, the engineer, has had 20 years of experience; and Capt. J. W. Williams has been a successful navigator of the Sound for a greater length of time. Both these officers enjoy the very highest reputation.

The "Commonwealth" steamboat is owned by the Norwich and New-London Steamboat Company, of which Henry B. Norton, Esq., is the President.

The route of the "Commonwealth" is between New-York, New-London, and Norwich, Conn.,—distance 134 miles,—in connection with the New-London, Willimantic, and Palmer, Norwich, Worcester, and Boston Railroads; and with her consort, the fine steamer "Connecticut," forms a daily line between New-York, New-London and Norwich, and by express trains to Worcester, Boston, Lowell, Lawrence, Portland, Fitchburgh, Keene, Nashua, Manchester, Concord, and the White Mountains. The steamer "Connecticut" had new boilers last year, and $15,000 has been expended in repairs this spring, to adapt her to the exigencies of this popular route.

The office of this line is at the foot of Cortlandt-street, New-York, where Mr. Martin, the Agent, will always be found in the faithful discharge of his duties.

LARGE TIMBER.

We learn from the Eastern papers that Messrs. Fowler & Kelsey, of Wallaceburg, Canada West, manufactured, last winter, probably the largest stick of white oak timber ever seen on the Continent of North America, measuring in the log 51 feet long, 40×41 inches square, and containing 580.83 cubic feet. It would require a diameter of tree equal to 4 feet 9 inches to make a stock of the size above-named, provided it was round and quite straight, which may not be considered very large either in the Northern or Southern parts of the United States. There was a white oak log picked up in Lake Ontario some years ago, which measured 60 feet long, and squared 36 inches from end to end, which, although it did not contain as many cubic feet as the log referred to, required a larger or heavier tree to make. We have had some experience among the giants of the forest, and although we have not brought such large timber to the manufacturing districts as those referred to, the facilities in the South being very much inferior to those of the North, East, and West, yet we may refer to some trees which are by no means to be regarded as dwarfs among the giants of the vegetable kingdom. We have cut more than one white-oak tree in North-Carolina, which measured 7 feet in diameter, and which would square 60 inches for at least 25 feet of its length. We have seen some large yellow-pine timber from the same State, and have cut some of considerable size. Messrs. Sneeden & Co., who built the steamboat Metropolis, of this city, used, in her construction, one of the largest sticks of yellow-pine timber we have known to come to this city; it forms part of her gallows-frame, and measured in the log as follows: 81 feet long, 3 feet 6 inches at butt, 23 inches square at top, containing 592 cubic feet, and was towed from North-Carolina to this city in a raft. The four legs of the gallows-frame measured as follows: 592, 355, 339, 332 cubic feet. The large stick was hewn to a proud edge on the corners, from end to end, and clear of sap, and sold at 1 dollar per cubic foot, cash.

WIDENING STEAMBOATS.

The Steamboat "*Knickerbocker*," originally built for a North River traveller, but more recently employed upon Long Island Sound, has been hauled out at the Dry Dock, New-York, for the purpose of receiving an additional breadth of beam, extending the whole length of each side, to within twenty or thirty feet of the ends. Having an easy bilge, and a round side line, it is found practicable to increase the displacement of the Knickerbocker very materially, without removing the wheel, and but slightly diminishing the length of buckets.

Not quite two feet is added to the breadth mid-ships, at load-line, but, by straightening the side-line for a space forward and aft of the wheel, the addition is made greater, and gradually retires to the old shape at the ends of the boat. The knuckle of the bilge is made as short as possible, consistent with the making of a good job. The manner of doing the work is as follows: First, remove a strake of the bottom plank, about the head of the short floor, fore and aft, as far as it is intended to make the addition. Then work a five or six inch strake in the place of the one removed, against which the heels of the false timbers will abut, in such manner as to bring the new planking flush with this new thick strake. Now timber out the new displacement, and plank with 2½ inch plank in the present instance. The new work extends quite up to the beams. The buoyancy and stability of the "Knickerbocker" will be increased, but the shape will now be unfavorable for speed.

The large North River steamboat New World, has also been taken out at the Dry Dock, and is having an addition of twelve feet made to her breadth, being six feet on each side. The manner of operations is as follows:—The plank are stripped off from the gunwale down to the short floor-head; then the frames are sawn off at the outside of the floor-head keelson, clear fore and aft, to within 25 feet of the stem and stern-post, and the new frames, which are already prepared, are erected in their places, being secured by screw bolts to the floors. The wheel and wheel-house have been removed, and the beams will require to be lengthened, and new guards and wheel-house built. No part

of the lower cabin has been removed, except the berths, &c., which were situated outside of the floor-heads. The dimensions of the New World will now be—length, 375 ft.; breadth, 46½ ft.; hold, 9½ ft.; being a greater length and breadth than has ever hitherto been given to a steamboat in the United States.

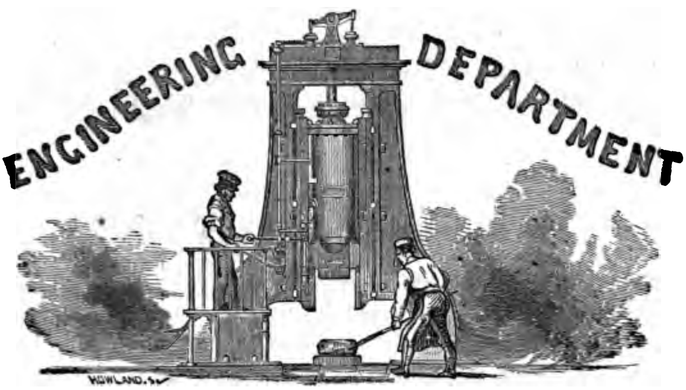
FRENCH CUSTOM-HOUSE MEASUREMENT.

TAKE the length on the surface of the deck, from the inside of the stem to the inside of the stern-post. When the ship has two or more decks, another length is taken, which is assumed to be the length of the keel, and is taken in the hold, from the stemson to the dead-wood knee; the mean of this length and that of the deck is the length for tonnage. The breadth taken is that of the inside, at its greatest extremity, wherever found between the ceiling. The depth is taken inside, from deck plank to ceiling, wherever it is found to be the greatest; the product in cubic metres is divided by 3.8, which is assumed the unit of a ton.

REMARKS.—On single-decked coasting vessels, in the Mediterranean, the measurement is taken between the timbers against the outside plank, inasmuch as the vessels of this class are but partially ceiled.

The cubic metre = 35.31658 cubic feet, in the measurement of the United States.

THE BRITISH SHIPPING ACT.—According to the new Merchant's Shipping Act, after the 1st of May next, every British ship is to have a distinct number assigned to her, by which she may be known and recognised, irrespective of her name or other description. The series of numbers will begin with 1, and proceed in regular arithmetical progression; a number once appropriated, will never be applied to any other British ship. The allocation of those numbers will be under the control of the Commissioners of Customs, who are to allot a certain series to every British Registrar throughout the empire. Thus, to the port of London, may be allotted the series from 1 to 1,000; to Liverpool, 1,000 to 2,000; to Sydney, 2,000 to 2,800, and so on to every port in the Queen's dominions.



DESCRIPTION OF SCREW STEAM VESSEL "BARWON."

(*Continued from p.* 137.)

Hatchways.—The comings of the fore hatchway are to be formed of angle-iron, 6 in. deep, riveted to the beams, and with a plate, 15 in. deep, carried round within, to cover the ends of the beams and car-lins; and also to give the comings sufficient elevation. The cover of the hatch is to be formed of iron plates, stiffened with angle-iron, and fitted with strong forged hinges on which the cover will open, and also with tightening-screws around the edges to screw the cover down. Within the cover there is to be an iron grating, which is also to be lifted on hinges to gain admission to the hold, and in the grating there is to be a manhole grating. The inner part of the cover of the hatch, on which the edge of the coming presses, when the screws are tightened down, is to be lined with wood or India-rubber, to enable the edge of the iron, by pressing into it, to make a water-tight joint, so that tarpaulins may be dispensed with. The main hatchway is to open down through the deck-house, and is to be fitted with wooden comings and wooden gratings in the usual manner.

Decks.—The water-way of main deck to be of pitch pine, 13 inches broad and 5 in. thick, scarphed and bolted together edgewise, and brought to a moulding on the outside of the ship.

The waterway to be laid with felt between it and the stringer-plates, and to be secured to the angle-iron running round the mouth of the ship, by wood screws passing up from below. Planking of main deck to be of yellow pine, 3 inches thick and 5 in. broad, secured to the beams by wood screws with conical necks, passing upwards from below, and secured also at the end of the planks to the iron stringer-plate, by screw bolts passing from above, and fixed with a nut beneath, the heads of the bolts being let into the wood, and covered with wooden plugs fitted in with white lead. The top of the deck-house to be of yellow pine, 2 inches thick, with strong water-way on each side. All decks to be carefully caulked with oakum of best quality, and the seams to be run in with pitch, or to be puttied with white lead putty.

CEILINGS OF HOLDS.—The holds to be ceiled with spars of American oak, 2 in. thick by 3 in. broad, and set 6 in. apart. The ceiling to be secured by rivets or bolts, passing through reverse angle-iron frames.

MAIN RAIL.—To be of English or American elm, 11 inches wide by 3 in., with neat moulding on edges.

TOP GALLANT RAIL.—To be of English or American elm, 6 inches wide by 2 inches thick, secured by an angle-iron to the bulwarks, and secured also to the bulwark stanchions. To be covered on the top with sheet brass.

PALL BITT.—To be of English oak, 12 inches by 14 inches, properly secured at the heel, and supported at the head by the fore-castle.

FORE-CASTLE.—A fore-castle deck, supported by angle-iron beams, set 3 feet apart, is to be carried back as far as the pall bitt, the head of which it is to support. This deck is to have a strong wooden beam against pall bitt, which is to be bolted thereto.

STEM-HEAD.—To be of pitch pine, 14 in. square and 9 feet long, tapered at bottom to fit bow.

KNIGHT-HEADS.—To be of American oak, 30 inches broad by 5 inches thick.

TIMBER-HEADS.—To be of cast iron and double, one to be placed on each bow, one on each quarter, and one on top of fore-castle deck.

Carving at Head and Stern.—To have a neat shield and head and carved trail boards, also suitable carving on the stern and quarter galleries.

Tanks.—To have an iron tank near the stern of the vessel, capable of holding 1,000 gallons, with tunnel passing through it for transmission of screw shaft. Another smaller iron tank is to be placed in the steward's pantry, with pump, to enable water to be raised from main tank at the stern, and fill pipe and air pipe, to enable it to be filled.

Bullion Safe, and Mail Room.—The space abaft the water tank at the stern, to be formed into a bullion safe and mail room, to which access only will be obtained through hatch in the cabin floor beneath one of the tables. The door of this hatch is to be fitted with a superior lock and key.

Bell.—To have a 14 inch polished brass bell, with ship's name, mounted on ornamental cast iron bracket on pall bitt.

Fog Whistle.—To have a large fog whistle, with six inch bell, with ebony or lignumvitæ handle.

Fire Engine.—One of the pumps worked by the engine is to be so constructed as to deliver water on deck and act as a fire engine; but besides this, there is to be a portable fire-engine, with suction-pipe, hose and nozzel, set upon wheels, so that it may be conveyed to any part of the ship. This fire-engine is to be furnished with six fire buckets of galvanized iron, to be used only in case of fire.

Guns.—Two small guns to be provided of polished brass, and set on ornamental cast-iron carriages.

Binnacles.—A binnacle, made of brass, of ornamental design, is to be placed at the stern, and another binnacle is to be placed upon the bridge. Corrected compasses to be fitted to each of these binnacles; and spare compasses to be provided with ascertained error, both at the stern and bridge, to enable the vessel to be navigated should the ordinary compasses chance to be carried away.

Rigging.—To be brig-rigged, with wire standing rigging, of Newell's patent wire rope; masts, spars, sails and rigging, to be all of the strongest and most efficient character, so that the vessel may be able to attain a good speed under sail alone. Masts

to be of yellow pine, and bowsprit of pitch pine. Dimensions of masts, yards, blocks, &c., to be as set forth in specification for rigging.

Sails, Awnings, &c. — The sails, awnings, boat sails, windings, sails, &c., to be of the best materials and workmanship, as more particularly set forth in specification of sailmaker's work.

Flags.—To be furnished with a complete set of Marryatt's signals and book; also one ensign and one Union Jack.

Chains and Anchors.—And also chains about the rigging, to be as set forth in specification of chains and anchors.

Boats—And boat furnishings to be as set forth in specification of boat-builder's work.

Windlass.—To be of English oak, 14 inches diameter, with pall wheel and pall bitts, patent whelps, gear wheel and pinion, and all the other fittings necessary for its efficient action.

Cargo, Winches, and Gin Wheels.—Two of each complete, with chains and cargo gaffs, to be fitted one on each mast. The cheeks of these winches to be of malleable iron.

Mast-Head and Signal Lights.—One mast-head and two signal lights to be provided, one red and the other green. These lan ps are to be of the most modern and approved construction, and are to be provided with spare glasses.

Pumps.—A pump with brass boxes to be fitted to each compartment of the vessel, as more particularly set forth in specification of plumber-work.

Sundries.—The vessel is to be provided at stern with chocks for leading ropes; curved pipes, for leading chains into chain lockers; riding chock for windlass; hawse pipes, ring and eye bolts, lockers for paint, oil, flags, &c.

Engine and Boiler.—The engine to be of 100 horses nominal power, with boiler power to enable the engine to work much above its nominal power. The engine and boiler are to be provided with all requisites for working them efficiently, and are to have spare parts and spare stores, to fit the vessel for a station where repairs are difficult of accomplishment. The engine-room to be provided with oil tank, tallow chest, and waste locker, also with a vice, anvil, hearth and bellows; also with lan-

terns, oil-cans, spanners, hammers, ash-buckets, firing-tools, and other furnishing, as more specially described in the inventory, so that the machinery may be capable of being set to work and kept going, without any expense for extras being incurred. Coal boxes to be fitted in engine-room, capable of holding 50 tons of coal; in addition to which, a communication is to be established between the coal-boxes and the after-hold, whereby either a portion or the whole of the after-hold may be used as a coal reserve, should the length of the voyage be such that a large supply of coal is required to enable it to be performed. The vessel is to be provided with a donkey-engine for feeding the boiler or pumping the water on deck, and is to be fitted with Holm's patent screw, and all other improvements of ascertained efficiency.

PAINTING AND GLAZING.—All the windows in deck-house, ranging from end to end, and two tiers deep in wake of cabins, to be of plate glass, when not of stained glass, and six patent side-lights to be fitted in the sides, and 12 deck lights with brass guards in deck. The hull of the vessel to receive three coats of good oil paint; but the sandings of the plates, previous to this, are to be painted with a mixture made of whiting and linseed oil, suffered to become quite hard before the other paint is applied. The bottom to have two coats of Peacock & Buchan's patent paint over the red lead.

THE CABINS TO BE PAINTED IN A TASTEFUL AND ORNAMENTAL STYLE.—The fore-cabin saloon to be painted in imitation of oak, and the after saloon on deck to be painted in an arabesque style. The exterior of the deck house to be so painted as to bring into relief the carved ornaments on its surface.

VENTILATION.—A fan to be set in the engine-room, with proper pipes leading into the cabins, for ventilating the cabins in a prompt and effectual manner. Provision to be made whereby the air entering into the cabins may be heated or cooled, if that be desired.

CABINS.—There is to be an upper and lower saloon for cabin passengers, two ladies' cabins, with water-closets adjoining, and four state rooms, affording berths in all for 74 chief cabin pas-
but provision is to be made for enabling the tables to

be converted into berths, on emergency, for 16 passengers more, whereby accommodation for 90 main cabin passengers will be afforded. For the fore-cabin passengers, there is to be a saloon and state rooms, which will together afford accommodation for 53 passengers; but the tables are to be also so made as to be converted into berths, on emergency, for five more, making the whole number 58, for which fore-cabin accommodation will be provided. The upper saloon aft, and the fore-cabin saloon, are to be contained in a house on deck, which is also to contain captain's and mate's cabins, stewart's pantry, baths, cook-house and caboose-house for crew, and hot air closet for airing linen. From the fore-cabin part of the deck-house to the fore-castle, a strong canvas, or tarpaulin covering, is to extend, to afford protection from the weather for at least 50 third-class passengers, making a total of 198 passengers to whom accommodation may be given.

Cabin Decorations.—The decorations of the cabins to be of the handsomest description. The windows are to be filled with stained glass. The sofa elbows are to be of lion's head and claw, and the sofas are to be covered with crimson or yellow plush. The bed-rooms to be fitted with wash-stands with marble tops; and the beds to be formed with ornamental gratings and handsome curtains. The sides of the lower saloon to be rosewood and gold, or crimson cloth and gold, and to be ornamented with mirrors and brilliant glass paintings. Rooms to be carpeted and finished with every requisite for immediate occu pation.

House on Deck.—The house on deck is to be 120 feet long, about 13 ft. wide, and 6 feet 7 in. high. To be framed with 2 in. angle-iron, spaced 3 ft. apart, and covered with plank 2 in. thick, ploughed and tongued. The coming of this house to be formed of angle-iron 6 in. deep, securely riveted to the deck beams, and to which coming the upright angle-irons of the sides of the house are to be firmly attached. The top of the house to be formed of deck plank 2 in. thick, laid on angle-iron beams, which are to be secured to the angle-irons of the sides of the house, by suitable plate knees. It is to be fitted all round with windows, filled with plate glass, which are to be closed

with suitable metal shutters, so as to protect the windows from the sea. In the wake of the fore and after saloons, there is to be a lower tier of windows in the side of the house, to give light to the cabins below; and in the after-saloons the whole of the windows are to be stained or painted in tasteful devices. The sofa elbows of the saloons are to be so planned as to serve as brackets for the support of the sides of the house. The top of the house is to constitute a promenade deck, and is to be fitted with a neat iron railing, tastefully painted or japanned, and a portion of it is to be surmounted by an awning.

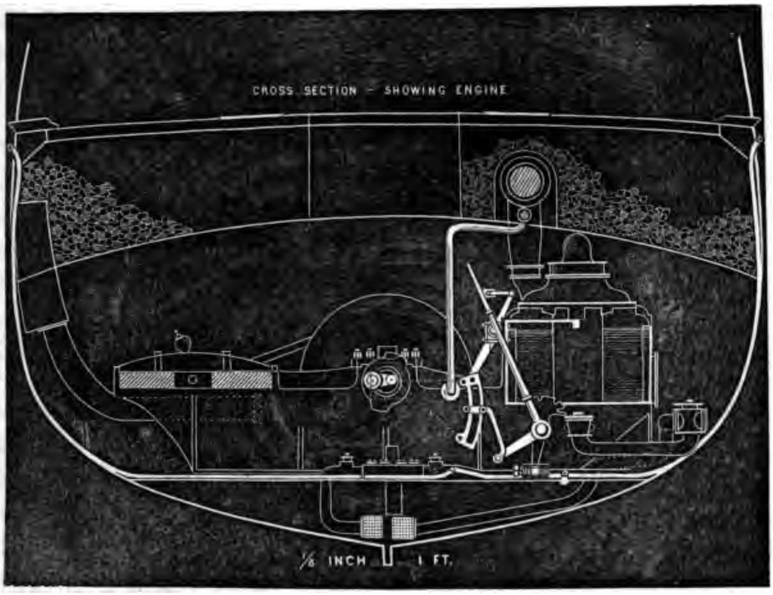
Cabins for Captain and Mates.—A captain's cabin to be fitted in the deck-house, with sofa covered with haircloth, mahogany table, drawers, desk, washstand, &c. A similar cabin to be fitted for the accommodation of first and second mates.

Accommodation for Crew.—A space to be fitted in the bow of the vessel for the accommodation of 12 sailors and 1 carpenter, which space is to be provided with proper bed-places, seats, table lamp, &c. Two patent side-lights to be fitted into this cabin, and lockers to be fitted for holding clothes. Access is to be obtained to the apartment for the crew, by a companion and trap ladder; and on one side of the passage leading from the ladder, there is to be a cabin for the engineers, and on the other side a cabin for the firemen. These cabins are to be fitted with bed-places, seats and tables, lamps, side-lights and lockers, and other things necessary for comfort. In the engineer's department the bed-places are to be sofas covered with black haircloth, and a desk is to be fitted for convenience in keeping a log.

Water-Closets.—The vessel to be fitted with eight water-closets, set forth in specification of plumber-work; and the deck-house to be carried to the ship's side amidships, for a sufficient length to enable water-closets to be introduced on each side at the gunwale. The framing for deck-house in this situation will be carried from gunwale to gunwale, and the top of the house in this part will constitute a bridge, extending from side to side.

Stewart's Pantry.—A large and commodious stewart's pantry to be provided in the deck-house, and to be fitted with shelves, racks, hooks, and other fittings necessary, and also with tank, brass basins, filter, &c., as more particularly set forth in

plumber-work. The tables in stewart's pantry to be made so as to be convertible into bed-places for stewart's servants.



BRITISH NAVAL FLOUR MILLS AND BAKERIES FOR THE BLACK SEA.

When the British troops were first *en route* for Turkey, now a year ago, a proposal was made to the government that a ship-mill and bakery should accompany the expedition, in order to supply the soldiers with good bread. This novel project was of course attended with many difficulties, all of which were finally surmounted, and the designs of the inventor for carrying out the undertaking submitted to the government and approved. But Lord Raglan and the Commissary-General, having expressed an opinion that the invention was not wanted, (what fogy thinks any *new* invention useful?) the project was deferred. The advocates of the proposition contended that the vessels might better be employed in grinding and baking in the waters of the

Black Sea, than in transporting wheat to England to be returned in biscuit; and moreover, to the comfort of invalids good bread was indispensable. The lamentable sufferings of the British army in the Crimea at length demanded the overthrow of stupid conservatism and the installation of the *new idea,* and two steam vessels were required to be fitted for this service with all possible despatch.

In the course of two months, Her Majesty's ship "*Bruiser*" has been converted into a complete flour-mill, capable of grinding from 700 to 800 bushels of wheat *per diem,* taking in the grain at one end of the vessel, and turning it out at the other in flour. The machinery is driven by the engine of the ship, and does not suspend the progress of the vessel in moderate weather.

The ship "*Abundance*" has been fitted up as a large bakery, and is capable of turning out 20,000 lbs. of bread *per diem,* by the aid of some simple machinery. The bake-house is thoroughly ventilated. The credit of this invention and undertaking is due to Mr. Penrose Julyan, a Deputy Assistant Commissary General, who has not yet received a shilling from the government for this exercise of his genius! Had he had the good fortune to have been born a Russian, he would, no doubt, have had a *step* and the order of St. Vladimir besides!

May these ships "*bruise*" "*abundance*" of bread for the tooth of *supercilious* war in the Black Sea. We have given some time since a description of a floating steam foundry and machine-shop. Modern warfare is taking so much of a *business* aspect, that we should not be surprised, if in the end, it was found that the resources to be drawn from the business pursuits of civil life were fully equal, if not superior, to the old contrivances of the fighting profession. Originality and genius, coupled with courage and enterprise, have done greater things than has yet been accomplished by the warriors of the Black and Baltic Seas, bound hand and brain with the rusty chains of hoary conservatism. We shall give a description of Mr. Julyan's ingenious, and most useful invention, in the next number of the *Nautical Magazine.*

LLOYD'S RULES FOR THE CONSTRUCTION OF IRON SHIPS.

In a wooden country like this, little attention is given to the construction of iron vessels, beyond the very limited demand for vessels of extraordinary light draught of water, say from one to three feet. In addition to those steam-boats intended for the California and South American rivers, few iron vessels have been built for the marine of the United States. Among the exceptions to this general rule, we find the famous *Iron Witch,* now called the *Erie,* and the air vessel built by Mr. R. L. Stevens, which are both of iron. The use of iron as a material of construction is much more general in England than in any other maritime country on the globe, and but for its influence on the compass, would be regarded as furnishing the index of a more rigid and thorough constructive material than wood, with which we have become so familiar. The elements of longitudinal strength, which is the basis of life-boat construction, and which the flexible wooden keel and keelson made up of short lengths, fails to furnish, may be fully secured in a mixed construction of wood and iron, with increased capacity and diminished weight. The importance of adopting rules for the guidance of those who use this more rigid material of construction, has been secured in England by the Lloyds, and may not be uninteresting to those who have given their attention more particularly to timbered vessels, as well as to those who may have occasion to know what modes of construction are adopted by our transatlantic friends.

The following rules were issued January, 1855. A government regulation has since come into force, providing that every iron vessel shall have two bulkheads of the same thickness as the outside plating. We can see no propriety in thus fitting iron vessels more than wooden ones, with bulkheads; nor do we see that thorough security can be obtained without first fitting a longitudinal bulkhead, or keelson along the middle line of the vessel, extending to the lower deck. We have in our mind the loss of the British iron steamer *Birkenhead,* which had transverse bulkheads, such as are described in the regulation, but

no longitudinal bulkhead, or keelson, save the usual iron keelson, as described in the following rules, and which, being run upon a reef of rocks, had one compartment after another to fill with water, and *break off and sink.* Thus the ship broke into pieces transversely for the want of commensurate longitudinal strength, which the sides failed to furnish when the compartments were filled with water. A longitudinal keelson would have saved her, by giving more strength, and confining the water to *that side of the ship* in which the leak was sprung or made.

RULES FOR THE BUILDING OF SEA-GOING IRON SHIPS OF ALL DESCRIPTIONS, WHETHER SAILING VESSELS OR NAVIGATED BY STEAM.

Considering that iron ship-building is yet in its infancy, and that there are no well-understood general rules for building iron ships, the Committee have not deemed it desirable to frame a scheme compelling the adoption of a particular form or mode of construction, but that certain general requirements should be put forward, having for their bases thickness of plates and substance of frame, showing a *minimum in each particular* to entitle ships to the character A for a period of years, subject, however, to certain periodical surveys, and also to a continuation of such character, should their state and condition justify it on a subsequent examination. For the purpose of attaining this object, the following rules and the accompanying table of dimensions have been formed:—

1. *Quality of Iron and Workmanship.*—The whole of the iron to be of good malleable quality; the workmanship to be well executed, and to be submitted to the closest inspection *before* coating or painting, and any brittle or inferior article to be rejected. It is not intended to prevent the coating of the plates *inside* in the way of the frame.

2. *Keel, Stem, Stern, and Propeller Posts.*—The keel, stem, stern, and propeller posts, to be scarphed or welded together at discretion, and to be in size according to the table. If scarphed, the length of the scarphs to be regulated in the proportion of eight times the thickness of the keel; and the stern-posts and after end of keel, for screw-propelled vessels, to be double the thickness of and tapered fair into the adjoining length of keel.

N. B.—Where the keel and keelsons are made of several thicknesses of plates, the plates that form the keel to be in thickness, taken together, the same as is required for a solid keel as per table; and the butts of the several plates of which the keel is formed, to be carefully shifted from each other, and from the butts of the garboard strakes.

3. *Ribs of Frames, Spacing, &c.*—The spacing and dimensions of the ribs or frames to be as per table; and the ribs or frames in as great lengths as possible, and to be fitted close on to the upper edge of the keel, and in all cases to extend to the gunwale; and wherever butted, to have not less than

four feet lengths of corresponding angle-iron, fitted back to back, to cover and support the butts and receive the plating; and if welded together, the welds to be perfect, and the shifts not to be less than four feet.

4. *Reversed Angle-Iron.*—The reversed angle-irons to be in size as per table; and in vessels of 300 tons and upwards, to be riveted on to *every other frame* up to the height of deck-beam stringer, and in vessels above 1,000 tons, to be riveted on *every frame* to the height of the lower deck or hold-beam stringer. The rivets for securing the angle-iron to the frame not to exceed six times their own diameter apart.

5. *Floor Plates.*—The floor-plates to be in thickness as per table; the depth to be regulated according to the depth of the vessel, as described in foot-note of table; and the reversed angle-iron on the upper edges to run across each floor or frame to above the turn of bilge. A floor-plate to be fitted and riveted to every frame; and at the ends of the vessel the floor-plates to be worked across the stem and stern-posts, so as to support and unite the sides efficiently to each other.

6. *Middle-line Keelson.*—The middle-line keelson, if of single plate, to be of the same thickness as the floor-plates, and to be well fitted and riveted to the same, and a reversed angle-iron to be fitted on each side, both of the top and the bottom, extending all fore and aft: the lower angle-irons to be secured to the reversed angle-irons on the top of floors. If box-keelsons be adopted, the plating to be of the thickness as per table, and in either case to be two-thirds of the depth of floor-plates.

7. *Bilge-Keelsons.*—The bilge-keelsons to be fitted and secured in an efficient manner, extending all fore and aft, and placed according to the form of the bottom.

8. *Plating.*—All plates to be well fitted and secured to the ribs and each other; the butts to be closely fitted, and to be united by having pieces or strips of not less than the same thickness as the plates, and of sufficient breadth for riveting, as described hereafter. No butts of outside plating to be nearer each other than one space of frames, nor to be nearer to a scarf of keel than that distance.

The space between the outside plating and the frames to have solid filling pieces closely fitted in one length, of the same breadth as the frames.

9. *Clamps and Extra Stringers.*—All vessels to have a clamp or ceiling-plate fitted between each tier of beams, all fore and aft inside the frames; and in small vessels, where there is but one tier of beams, then about two feet below them. The plate to be of the same dimensions as given for stringer-plates upon beams in the table, and to be properly riveted to the frame.

All vessels above 500 tons to have fitted between the bilge-keelsons and the hold-beams, at the upper part of the turn of bilge, strong angle-irons, as stringers, extending all fore and aft, riveted back to back to the reversed irons on the frames; the size of them not to be less than those used for the middle-line keelson.

10.—*Beams.*—The beams to be of dimensions as per table, and to be made of "bulb" or any other approved iron plates, with reversed angle-irons riveted to the plates, and the upper-deck beams to be fastened to alternate frames; the lower deck or hold beams to be fastened to every second and every fourth frame alternately, excepting in hatchways (where there must be half-beams), and to be well and efficiently connected or riveted to the corresponding frames at the sides with brackets or knee-plates of thickness equal to the beams, and in length as per table. The beams of each deck to be over each other, and pillared.

11. *Rivets and Riveting.*—The rivets to be of the best quality, and to be one quarter of an inch larger in diameter than the thickness of plates through which they pass in the stem, stern-post, and keel; and in the remainder of the plating, as per table, to be regularly and equally spaced, and carefully punched opposite each other, in the laps and lining-pieces, or, strips; to be countersunk all through the outer plating, and not to be nearer to the butts or edges of the plating, lining-pieces to butts, or any angle-iron than a space not less than their own diameter, and not to be farther apart from centre to centre than three times their diameter, and to be spaced through the frames and outside plating a distance equal to eight times their diameter apart. When riveted up, they are completely to fill the holes; and their points or outer ends are to be round or convex, and not to be below the surface of the plating through which they are riveted. The stem, stern-post, keel, garboard strakes, and butts of outside plating, to be double riveted in all vessels. The butts and edges of outside plating to be truly fitted, carefully caulked, and made water-tight.

12. *Bulkheads.*—All vessels to have, at least, two water-tight bulkheads built at a reasonable distance from the ends, to extend from the keel to the upper deck in vessels of two decks, and to the middle deck in vessels of three decks; such bulk-heads to be well supported and strongly made of plates and angle-iron of sufficient thickness, according to their height and breadth. The angle-irons not to exceed 3 feet apart, and the whole to be efficiently connected and riveted together, and to the corresponding floors, beams, and ribs.

13. *Ceiling.*—The wood ceiling or lining of vessels from 100 to 3,000 tons to be from 1½ to 3 inches in thickness, in proportion to the tonnage; and to be so fastened to the reverse angle-irons or frames, that in the event of rivets springing or leaking, it may be easily removed.

14. *Decks, Water-ways and Plank-sheers.*—The decks, water-ways, and plank-sheers, if of wood, not to be less in thickness or inferior in quality, than is prescribed for vessels built of wood of the same tonnage and grade. The flat of upper deck to be fastened by screw bolts put through from the upper side, and to have nuts at under side of the angle-iron of the beams; and the water-ways to be similarly fastened to the stringer-plates.

15. *Vessels with Three Decks.*—In all vessels having three decks, the middle-deck stringers are to be fitted home to the outside plating, and riveted

to the angle-irons secured thereto; also to have an additional angle-iron extending all fore and aft inside of the ribs, and either above or below the stringers riveted to the same, and to the reversed angle-irons on the frames. All vessels to have above each tier of beams a plate each side the hatchways, of not less than ten inches in breadth by half an inch in thickness, and extending all fore and aft throughout, and well riveted to upper side of all the beams, deck-hook, and transom: also to have plates, where practicable, of the same dimensions, extending diagonally from side to side, riveted to the upper side of upper-deck beams and stringer-plates.

16. *Rudder.*—The main-piece of rudder to be made of the best hammered iron, and so arranged as to ship and unship, where practicable, without docking; and the main-piece to be in size according to the table.

17. *Surveys.*—Vessels intended for either the 12, 9, or 6 years' grade, to be surveyed at least five times, in the following order, viz.:

On the several parts of the frame, when in place, and before being coated, and before the plating is wrought.

On the plating during the progress of riveting.

When the beams are in and fastened, but before the decks are laid.

Again, when the ship is complete, and before the plating is finally coated.

And, lastly, after the ship is launched, either in dry dock or laid on blocks, or otherwise, so that the keel may be examined.

All vessels to be subject to occasional or annual survey, when practicable, and every third year to be specially surveyed in dry dock, or laid in blocks, with both surfaces of outside plating exposed; also, at the expiration of the full period originally assigned, when the water-ways and plank-sheers, if of wood, are to be scraped bright; and at that time, if it is found that no material diminution of thickness, by corrosion or wear, has occurred, the vessel, being in all respects in efficient condition, may then be continued for a further period, not exceeding one-half the whole number of years first assigned.

On the expiration of the terms assigned to ships classed A, they will be liable to lapse (like ships built of wood) into the dipthong Æ class, unless again specially re-surveyed, to determine their claims to be allowed a higher character.

18. One year will be added to the character of all ships of the A class, built under a roof which shall project at each end beyond the length, and on each side beyond the breadth, a quantity equal to one-half the breadth of the vessel.

19. Vessels not surveyed while building, will be classed A from year to year only, but for a period not exceeding six years.

The rivets to be of the best quality, and to be one quarter of an inch larger in diameter than the thickness of the plates through which they pass in the stem, stern-post and keel, and in the rest of the plating as per table; to be regularly and equally spaced, and carefully punched opposite

IRON SHIPS.

Table *of Minimum Dimensions of Frames, Plating, Rivets, Keels, Keelsons, Stems, Stern Posts, Floor Plates, Beams, Stringers, &c.*

Gross Tonnage.	Keel, Stem and Stern Post, for all grades.	Distance of Frames or Ribs from Moulding Edge to Moulding Edge, all fore & aft. Years 12	Distance of Frames, Years 9, 6	Frames or Ribs. Dimensions of Angle-iron for all grades.	Dimensions of Reversed Angle-iron of all grades.	Thickness of Plates.† Garboard Strakes. Years 12	Garboard Strakes. 9	Garboard Strakes. 6	From the Garboard to the upper part of Bilge and the Sheer Strakes; also thickness of ‡Hold or Lower Deck Beams, & MiddleLineKeelson. Years 12	9	6	From Bilge to Sheer Strakes, thickness of ‡Upper and Middle Deck Beams, ◊Floor & ‖Stringer Plates upon BeamEnds; also Hooks & Crutches. Years 12	9	6	Dimensions of Angle-iron on Beam Stringers or Keelsons for all grades.	Rudder for all grades. Diameter at the Head.	Diameter at the Heel.
	Inches.	Ins.	Ins.	Inches.	Inches.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Inches.	Ins.	Ins.
100	5½×1½	16	18	5-16×2½×2	4-16×2 ×2	7-16	6-16	5-16	6-16	5-16	4-16	5-16	5-16	4-16	5-16×2½×2	2½	2
200	6 ×2	16	18	5-16×3 ×2	4-16×2 ×2	8-16	7-16	6-16	7-16	6-16	5-16	6-16	5-16	4-16	5-16×2½×2½	3	2
400	6½×2½	16	18	6-16×3½×2½	4-16×2½×2	9-16	8-16	7-16	8-16	7-16	6-16	7-16	6-16	5-16	6-16×4 ×3	3½	2½
600	7 ×2¾	16	18	7-16×4 ×3	6-16×3 ×2½	10-16	9-16	8-16	9-16	8-16	7-16	8-16	7-16	9-16	7-26×4½×3½	4½	2¾
800	7½×3	16	18	8-16×4½×3	6 16×3 ×3	11-16	10-16	9-16	10-16	9-16	8-16	9-16	8-16	7-16	8-16×5 ×4	4½	3
1000	8½×3	16	18	8-16×5 ×3	7-16×3½×3	13-16	11-16	10-16	11-16	10-16	9-16	10-16	9-16	8-16	9-16×4 ×4½	5	3
1200	9 ×3	16	18	9-16×5 ×3½	8-16×3½×3	14-16	12-16	11-16	12-16	11-16	10-16	10-16	9-16	8-16	9-16×5½×4½	5	3¼
1500	10 ×3	16	18	9-16×5½×3½	9-16×4 ×3½	15-16	13-16	12-16	13-16	12-16	11-16	11-16	10-16	9-16	9-16×6 ×5	5½	3½
2000	12 ×3	16	18	10-16×6 ×4	10-16×4½×3½	16-16	14-16	13-16	14-16	13-16	12-16	12-16	11-16	10-16	10-16×6½×5½	6	3¾
2500	12 ×3¼	16	18	11-16×6¼×4	10-16×4½×3½	16-16	15-16	14-16	15-16	14-16	13-16	13-16	12-16	11-16	10-16×6½×5½	6½	4
3000	12 ×3½	16	11	11-16×6½×4	10-16×4½×3½	16-16	15-16	14-16	15-16	14-16	13-16	13-16	12-16	11-16	10-16×6½×5½	6¾	4½

Proportionate Diameter of Rivets........	⅝ of an inch.			¾ of an inch.			⅞ of an inch.				1 inch.		
To thickness of Plates	4-16	5-16	6-16	7-16	8-16	9-16	10-16	11-16	12-16	13-16	14-16	15-16	16-16

* When hollow plate keels are adopted, their thickness should not be less than one and a half that of garboard strake.

† Plating not to be reduced in thickness at the ends of the vessel from keel to upper edge of wales.

‡ All beam-plates to be in depth one quarter of an inch for every foot in length of the mid-hip beam; to have double angle-iron upon upper edge, siding and moulding together of each to be not less than three-fourths the depth of beam-plate.

◊ Depth of floor-plates not to be less than one inch for every foot of the vessel's depth in hold.

‖ Stringer-plates upon beams to be in width twice the siding and moulding of the angle-iron frames; each arm of knee-plates to be in length three times the depth of beams.

each other in the laps and lining-pieces or strips; to be countersunk all through the outer plating, and not to be nearer to the butts or edges of the plating, lining-pieces to butts, or any angle-iron, than a space not less than their own diameter, and not to be further apart from centre to centre than three times their diameter, and to be spaced through the frames and outside plating a distance equal to eight times their diameter apart. When riveted up, they are completely to fill the holes, and their points or outer ends are to be round or convex, and not to be below the surface of the plating through which they are riveted. The stem, stern-post, keel, garboard strakes, and butts of outside plating to be double-riveted in all vessels.

By order of the Committee,

——— ———, *Chairman.*

CHARLES GRAHAM, *Secretary.*

LONDON, 14*th December*, 1854.

OSCILLATING ENGINES OF PROPELLER GRANITE STATE.

OFFICE OF "THE BUFFALO STEAM ENGINE WORKS,"
Corner of Washington and Ohio streets.

BUFFALO, *April* 19*th*, 1855.

Messrs. GRIFFITHS & BATES,—

Gents:—Capt. H. Whittaker has requested me to send you a description of the engines in the propeller "Granite State," of Messrs. Crawford & Chamberlin's line on the Western Lakes. The dimensions of the boat are as follows:—Length of keel, 137 feet; breadth of beam 25 feet; depth of hold, 11 feet; draught of water when ready for sea, 9 feet. Dimensions of Engine—Cylinder, 24 inch diameter of bore, and 36 inch length of stroke, (oscillating), connected direct to crank-pin on propeller-shaft, without intermediate gearing and with a propeller-wheel of 11 feet diameter, 16-5 feet pitch, 26 inches wide fore and aft. At draught of 9 feet per average speed is 10 miles per hour, engines making 80 revolutions, and with 100 lbs. pressure per square inch. The engine will make 95 revolutions, giving her a speed of 12.5 to 13 miles per hour. The boiler is a return tubular, and has 1100 feet of effective fire surface. The whole amount of machinery, including boiler, weighs 24 tons. She will consume about 1 1-8 cord of wood per hour at the above speeds. I built the engine in Cleveland, in the year 1852, and I believe it is the first and only one of the kind that has ever been put in successful operation on the Western Lakes. It has not failed in any respect, but has given entire satisfaction to the owners. However, during the constructing of it, there were many builders and engineers who pronounced it a humbug and failure; but practice has proved

their objections to be hypothetical, and it is now acknowledged that oscillators are the best description of engine for marine purposes, as they possess a compactness not obtainable in any other form short of a rotary, and present few of the difficulties anticipated. I have several other engines on the Lakes, and am now building for Mr. Luthan Moses two engines of same description, to be put in one vessel of 200 feet keel, 36 feet beam, 13 feet hold, two wheels same as above, two return tubular boilers.

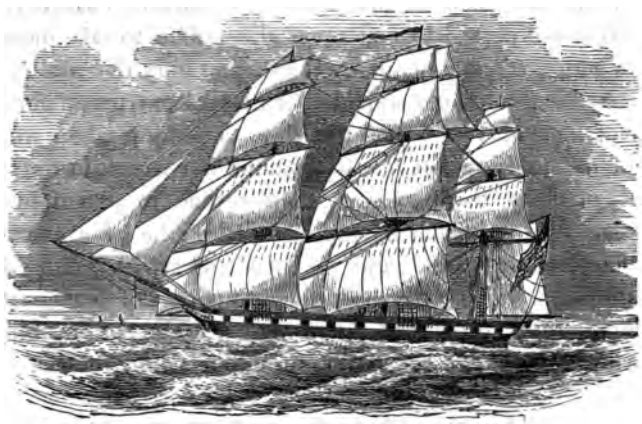
Respectfully, your obd't. serv't.,

E. H. Rees, *Sup't.*

CORBETT'S LINING FOR VESSELS.

Mr. V. P. Corbett's recently patented plan of interposing a stratum of India-rubber between the frames and ceiling of vessels, is attracting some attention. Mr. C. does not confine himself to this location of the material, as it might perhaps be preferred by some to place the safeguard outside of the frame, or even outside of the plank. There appears to be no serious difficulty in joining the sheets together, and the expense, although very considerable, would not be an insuperable objection. If the gum is durable, and retains its elasticity, in such a situation, there can be little hesitation in pronouncing this invention one of great importance. Such a lining would undoubtedly save a large number of vessels, by allowing itself to conform to a considerable change of the parts, and still retain its integrity. Locating the rubber on the outside instead of inside the frames, would apparently have the advantage of defending also the spaces between the frames from filling with water; but there is danger that from the imperfect support afforded by the frames, the coating might be forced by the pressure from without, first to extend itself partially into the spaces between the frames, and finally to burst and become useless. Within the frames, however, it would have a continuous support from the ceiling, and no such accident could be anticipated.

Nautical Department.



LANES FOR THE STEAMERS CROSSING THE ATLANTIC.

BY M. F. MAURY, LL. D., LIEUT. U. S. N.

The underwriters of New-York and Boston, with a truly commendable and enlightened spirit, have entered upon the publication of several thousands of copies of the following letter from Lieut. Maury, concerning the Atlantic Steam Lanes which were originally proposed by R. B. Forbes, Esq., of Boston, subsequent to the loss of the steamship Arctic. It is truly gratifying to observe the zeal with which the honorable gentlemen composing those Boards, as well as many others equally interested in the salvation of life and property on ship-board at sea, have entered into the development of Mr. Forbes's ideas. This is indeed an age having a reputation for utilitarianism, and when we see with what spirit and unanimity our commercial leaders have entered upon the execution of two most excellent devices, viz., for securing safety in the steam navigation of the North Atlantic, and immunity from hazard in approaching the New-Jersey and Long Island coasts, we are encouraged to expand our thoughts towards the comprehension of one more idea, which has remained for the marine architect to propose as

pre-eminently worthy of consideration. We refer to the idea of making all our steam vessels for passenger transit, *life boats in their construction.* This was the proposition of the conductors of this Magazine at the time of the Arctic calamity, and they have not ceased to call upon the public to take measures for its adoption; and again we insist, that only the most extraordinary circumstances should ever compel the passengers and crew of a steam vessel (and the time is coming when we may add of all vessels whatever) to abandon her wreck in frail *boats* at sea, or oblige them to trust their rescue to patent life-preservers. We trust that having disposed of the labor in preparing the "Steam Lanes," and the new chart with sailing directions for approaching the most dangerous part of our coast, the public mind will now rest for a season upon the feasibility of securing a life-boat construction in all our steam vessels.

NAVAL OBSERVATORY, WASHINGTON, *Feb.* 16, 1855.

Dear Sir:—I have to-day the pleasure to forward to you, for the Board of Underwriters, as per your request of the 25th ult, a copy of my Letter to the Underwriters and Merchants of Boston, concerning lanes for the steamers crossing the Atlantic.

The subject has received a most laborious and patient investigation. Illustrative of the position assigned to each of these lanes, all the material afforded by abstract logs, containing the observations of not less than 46,000 days, concerning wind and weather, sea and currents, along the route of the proposed lanes, have been examined and discussed.

I have risen from the labor entailed by this discussion, greatly encouraged, for I find the adoption of the lanes, so far from materially lengthening the passages to and fro, will probably shorten the average to the West, and not increase the average to the East, more than a few hours, if at all.

While I am encouraged to believe that their adoption will not, therefore, materially prolong the time—and time, in steaming across the ocean is, I am aware, a very precious thing—I also have the satisfaction of announcing with boldness that it will tend in no small degree to lessen the dangers of the sea. Is the expression too strong? I think not, if you take it as meaning to lessen the *probability* of collision between steamer and steamer, steamer and sailer, and the *chances* of shipwreck by running ashore in the dark.

Hoping that an examination of the subject may so impress also the owners of these lines, those who underwrite for them, and those who cross the sea in them,

I have the honor to be,

Respectfully, &c.

M. F. MAURY,
Lt. U. S. N.

WALTER R. JONES, Esq.,
President of the Board of Underwriters, New-York.

Letter from Messrs. John S. Sleeper, C. W. Cartwright, J. Ingersoll Bowditch, R. B. Forbes and others, underwriters, shipowners, and merchants of Boston.

January 8, 1855.

Lieut. M. F. Maury, *National Observatory, Washington.*

Sir:—In connection with the discussion respecting the dangers of crossing the Atlantic, and the modes of diminishing them, we have observed a suggestion contained in your letter to Walter R. Jones, Esq., of New-York, proposing one route for steamers to go, and another for them to come, of which idea you cite our fellow-citizen, R. B. Forbes, Esq., as the original author.

Permit us to hope that this project may receive your farther attention, and that you will prepare a chart, exhibiting the routes suggested, so laid off as may, in your judgment, best answer the purpose in view, of lessening the liability of collision, without materially lengthening the passage.

By thus carrying out a proposition which strongly recommends itself to many, you will add another important service to the many for which we would express our thanks.

ANSWER TO THE ABOVE,

Dated Feb. 15, 1855.

Gentlemen:—I duly received your communication of the 8th ult., requesting me to carry out the proposition contained in my letter of the 8th of November last, to Walter R. Jones, Esq., of New-York, by projecting the two steam lanes across the Atlantic, viz.: one for the steamers to go in, and the other for them to come in.

I at once addressed myself to the task, and after a careful examination of the somewhat ample materials afforded by this office, I have at length the pleasure to submit charts with the lanes projected on them, together with other matter bearing upon the subject.

I have examined a number of the logs both of the Collins and the Cunard lines. The part of the ocean used by them in their voyage to and fro, between the meridians of 15° and 65° west, is, for the American, 300 miles broad, and for the English 150 miles broad. The American road-way overlaps and includes the English. Consequently there is a breadth of ocean 300 miles wide, in any part of which, a sailing vessel by night or in the fog, is now liable to be brought into collision with the steamers.

Now suppose we take this same breadth of ocean and lay off a lane twenty or twenty-five miles broad near its northern border, and another, fifteen or twenty miles broad near its southern border, and recommend the steamers, when coming westwardly, to use the former, and when going eastwardly, to take the latter, would not the adoption of the recommendation contribute to the safety both of steam and sailing vessels; of passengers and crew? I think so.

I do not mean to create the impression, by anything I say or do, that the adoption of these lanes would *do away* with collisions, or call for less vigilance, or relieve in any manner the shipmaster from his obligations to look closely to the navigation of his vessel, to be watchful, prudent, cautious, and careful. On the contrary, he must never relax his attention to the seaman's three L's, nor slight his water thermometer. The adoption of the lanes will simply lessen the *liabilities*, by diminishing the *chances* of collision, and to that extent make the navigation of the Atlantic *less* dangerous. So far from relaxing attention to the log, lead, and look-out, these lanes call for in

creased diligence on the part of the master, for that breadth only is given to them which will just make them broad enough to cover the probable errors in latitude of a good, careful navigator, after he has been two or three days without an observation. A narrower lane would be forbidding, from the difficulties of keeping in it; a broader lane would be mischievous by relaxing its calls upon the attention of the master to keep his steamer in it, and by occupying so much of the ocean that sailing vessels would not so willingly, because they could not so conveniently, give it up to the steamers.

If these lanes be adopted by the steamship companies, and engraved on the general charts of the Atlantic that are used by the vessels of the different nations, and marked as they are on the chart of the Atlantic, by Blunt, herewith sent, or as I have instructed the engraver to project them on the Track Charts, series A, of the North Atlantic, and as they are on Plate of Tracks (appended) I have very little doubt that sailing vessels would, in the process of time, make it a rule to edge off from the lanes, especially at night and in thick weather. In the first place, the lanes are so narrow that if the sailing vessel have to cross them, as in head winds, and in the progress of her voyage she not unfrequently will, she will be but a little while in them, and her master will then know on which side to watch for the danger. In the next place, if his course lie along the lane, and the winds be fair, he will, as night comes on, or as the weather grows thick, begin to think of the steamers and collision, and his own responsibilities, and then feel much more comfortable by edging off to one side and leaving the steam-track clear.

The average route of the steamers coming, as determined by the abstract logs on file here, crosses the meridians of 40°, 45°, and 50°, from forty-five to sixty miles north of the lane to America, and joins it on the meridian of 55°, and then runs nearly along with it to Sandy Hook.

The lane coming is, therefore, a better road than the average route at present used, and for these reasons, viz: It is thirty miles shorter; it runs so far south of Cape Race and the Virgin Rocks, that no time need ever be lost in turning aside when fogs prevail, to avoid these dangers, for it passes one hundred miles south of Cape Race.

This statement, without any explanation, might appear paradoxical, for the nearer to Cape Race the shorter the distance; yet, practically, it has not proved so, because vessels, especially in the fog, as they near this cape, have frequently to run one, two, three, or more hours to the southward, to be sure of clearing it. When they are so running, they are not making much headway towards their port. So, on the long run, the attempt to shave Cape Race makes the average distance practically greater than it is by the lane. Indeed, it is greater than the statement above implies, for the distance which I have taken as the average by present routes is measured by straight lines from position to position, at noon.

Congress has given the Secretary of the Navy authority to employ three vessels in assisting me in my researches, by testing new routes, and perfecting new discoveries. They can be very usefully employed just at this time. Perhaps he may find it convenient in the spring to detail one or two of them for this service. If so, I shall urge upon his attention the importance of completing the deep-sea soundings across this part of the Atlantic, and also ask for an examination of the Virgin Rocks, with the view of planting on them, or just under their lee, a bell buoy. In that case, this lane might be lifted up so as to shorten the distance and save time by bringing this buoy on the edge of it, and thus provide a landmark that would be very useful in all weather and to all classes of vessels.

The shortest distance possible for a steamer between Liverpool and Sandy Hook is 3,009 miles; the average distance actually accomplished is 3,069 miles, and the distance by the middle of the lane coming is 3.038. There is also another recommendation in favor of this lane to the west, which is this: It lies along the northern edge of the Gulf Stream, where there is an eddy setting to the westward often at the rate of a knot an hour. On the average, I assume that the set of this eddy will amount to twelve miles a day for three days and a half, or say 40 miles. This makes the distance by the lane coming practically about 2,998 miles; or, allowing twenty miles for detour, we shall have 3,018 miles, which will shorten the average time of the passage this way three or four hours, with less risk of collision, and less danger from Cape Race by the way.

It may be urged against this lane that it cannot always be followed on account of the ice, and that inasmuch as it crosses the Grand Banks, the steamers that ply in it may now and then run down a fishing vessel. The reply is, that as far as the fishermen are concerned, they are now liable to be run down by the steamers both going and coming. Whereas, with the lane, that liability is incident to the steamers alone that are westwardly bound, and the fishermen will have the advantage of knowing pretty nearly where the steamer will pass, and which way she will be coming. And as for its being obstructed by ice, so as to compel the steamers, as it occasionally will, especially in May and June, to turn out of it now and then, the Erie Canal, of New-York, is obstructed by ice the whole of every winter, but that does not prove it to be of no value; it only shows that it, like this lane, would be of more value to commerce if it were never obstructed by ice, or anything at all.

You will observe by looking at this lane upon Blunt's Chart, that the Grand Banks afford a pretty good landmark, which can be used in the thickest weather. Generally the water thermometer is found to fall as soon as you near these Banks: it is generally a good landmark for them. The eastern edge runs north and south, and, therefore, affords an excellent correction for longitude. Having ascertained, by the lead, when the vessel first strikes this edge, then noting the soundings and the distance run before clearing the Grand Banks, the latitude will also be known with accuracy sufficient to enable the navigator to decide whether he be in or out of the lane, and if out, on which side. The lane crosses the Banks near their greatest width, 275 miles. If a steamer be crossing there in a fog, and in doubt as to her position, she can judge, by their breadth and the soundings, pretty nearly as to latitude. For instance, if the breadth of the Banks, when crossed, be less than 275 miles, but the soundings not less than forty fathoms, the vessel has crossed the Banks to the north of the lane; but if she find herself in less than thirty fathoms, then she has crossed to the south of it. Should she, however, find herself in water that suddenly shoals to less than twenty fathoms, and as suddenly deepens again, then she is near the Virgin Rocks, or the rock and nine-fathom Bank to the east of them, and her position is immediately known.

It should be recollected, however, that these lanes are not channel-ways in which steamers must keep or be lost. Gales of wind, ice, and other things, will now and then force a steamer out of them, and in such cases she will actually be where she is now, for she will then be in no more danger than she is now; only when she gets back into the lane she will be in less.

You will doubtless observe the advantageous position of the fork to Halifax, in the lane from Europe. As this lane approaches Newfoundland, it edges off to the South, in such a manner as to render it impossible for a

vessel so to miss her way as to get ashore. Suppose a steamer attempting this lane to be, when she nears the Grand Banks, 100 miles out in position (a most extravagant case,) and that she be out on the Newfoundland side, she would, if behaving properly, be steering parallel with the lane, and if bound to New-York, she would go clear of Cape Race. But she might be bound for Halifax, and by steering west too soon, might run upon the land; but recollect that the lane to Halifax turns off *on soundings*, and a west course from where the lane from England strikes soundings on the Grand Banks will take you clear of everything. So without the most gross neglect of the lead and all the proper precautions, which it is the duty of the shipmaster to take, it would seem impossible for him to run his steamer into danger here.

In the longitude of the Grand Banks, the lane to Europe is 200 miles south of the lane to America. As a rule, this lane for the eastern bound steamers can be followed always, admitting that an exception now and then in practice will make the rule general. It will be observed, that this lane runs E. 15° S. from Sandy Hook to the meridian of 70°, where it takes a course E. 12° N., towards its junction with the arc of a great circle, south of the Grand Banks. Though the distance by this lane, from Sandy Hook to this junction, is a few miles longer than the direct line, yet on account of the Gulf Stream it is in *time* the shortest distance that a steamer can take. From the Capes of Delaware it is obviously the shortest.

The distance from Sandy Hook to Liverpool, by this lane, is 106 miles greater than it is by the lane coming. But the lane going is in the Gulf Stream, which of itself will nearly, if not quite, make up for this difference. The San Francisco steamer was wrecked in the Gulf Stream, and from the time she was disabled till she was abandoned, she drifted at the rate of two knots an hour. When the Great Western steamship first came over, she stemmed the Gulf Stream, and was set back in it 175 miles during the voyage. Now, from the Grand Banks west, the track of the Great Western was not as much in the strength of the stream as this lane is, for she passed to the north of it. This trip, too, was in April, when the middle of the stream is well south.*

I may be excused for mentioning, in this connection, an incident relating to the early history of ocean steam navigation. After this passage of the Great Western, I wrote a paper on the achievements of the New-York packet-ships, and pointed out on a chart the great circle route from New-York to England, and commended it to the attention of those concerned in this new navigation. The paper, with the chart, was published in the *Southern Literary Messenger* (Richmond, Va.), for January, 1839. The editor sent a copy to Captain Hoskins, and he ever afterward went by the route recommended on that chart. His competitors stuck to the old rhumb-line route, and from that time, Hoskins generally beat them, this way, about a day: and here is the explanation. They were set back, in the Gulf Stream, 150 or more miles; he was set forward forty or more, by the eddy, and gained some 50 or 60 additional, by the great circle, which made altogether about one good day's sail in his favor. The great circle, or Cape Race route, was not generally adopted, however, even when he left the line; and it has been mischievous by tempting navigators to shave the cape too closely.

The current of the Gulf Stream is not only in favor of the lane going, but the gales are more favorable, and the fogs less frequent than they would be by a more northerly route.

* The thread or axis of the Gulf Stream moves up and down in declination as the sun does, being farthest north in September, farthest south in March. Its limits are not accurately described on any general chart that I have seen.

In order to enable you to judge knowingly as to the relative merits of these two lanes in this respect, I have, with the help of the most willing, zealous, and able corps of assistants that one ever had, and such as can be formed only of navy officers, examined and discussed abstract logs containing observations for no less than 46,000 days, on the winds, weather, the sea, and the currents, in the parts of the ocean through which these lanes pass. The result of that discussion I submit herewith for information, on a chart of engraved squares. The horizontal lines are there marked as per cents., each being counted as one, and every fifth one being a little more heavily ruled than the rest. The vertical lines, marked 70°, 65°, 60°, &c., are meridians of longitude between which the lanes pass. Between each two of these meridians are twelve columns for the twelve months, beginning always with December, the first winter months. Thus, the navigator wishes to see what is the most foggy month in the lane to America between the meridians of 70° and 75°. He finds on the plate the fog curve for that hour, and his eye is immediately attracted to the remarkable peak formed by this curve, in the July column between these meridians; the meaning of which is, that, according to the averages derived from these 46,000 days, the probabilities are, that if he were to pass along this part of that lane one hundred times, in the month of July, but in different years, he would find it foggy twenty-eight times; or, in other words, twenty-eight per cent. of the days in July are foggy along that part of the lane. Casting his eye farther along, he will see that fogs, at certain seasons of the year, are astonishingly prevalent from lon. 55° to lon. 45° (on the Grand Banks,) and when he comes to count the columns, he will find that June is the foggiest of months. But the relief and the consolation is, that that is precisely at the season of the year when daylight is the longest, so that even here there is compensation.

Now he looks at the fogs for the lane going, and he is struck with the more modest flexures of the curve, and particularly with the fact that both the fog curves almost invariably come down to the zero (0) line near the meridians. In other words, that the fogs are less prevalent in both lanes, during the autumn and winter, when there is least daylight.

In like manner, he wishes to know as to his chances for meeting with a gale of wind, as he passes along in the lane to Europe, and whether these gales will be adverse or fair; in other words, whether they will have easting or westing in them. Now, he sees, under the head of "Lane to Europe," (Chart appended,) by the curve marked "fair gales," that the most stormy part along this line is between the meridians of 35° and 40°; that here, in January, it is blowing a gale of wind half the time (fifty-two per cent.), while at certain other seasons of the year gales seldom or never occur. But these gales all have westing in them, and are, therefore, fair. The preponderance of fair gales along the lane to Europe, viz.; all gales having westing in them, is very striking. The vessel will be running with these gales, and therefore diminish their strength. In like manner the gentle flexures in the curve marked "head gales," denote how much less frequently gales with easting in them are to be met with in the regions through which this lane passes. Now he will be struck with another remarkable physical fact which experience has proved and these statistics have developed; that fogs and gales, in certain parts of the lanes, seldom come together; for instance, as the fog curves run up, the gale curves, both for coming and going, come down, and *vice versa*. This feature is very striking all the way from the meridian of 25° to that of 55°. These curves are both suggestive and instructive. Others have been added to show, also, the per cent. of calms, rains, and thunder and lightning, by each lane.

That you may judge also as to the relative frequency with which the parts of the ocean in which these two lanes are traversed by sailing vessels, I have projected them also on series A of the Wind and Current Charts.

You will observe by referring to this series, that the part in which the lane going, lies, is very much frequented, but it is frequented mostly by vessels going. (See also Track Plate, appended.) Those that are coming this way, that is to the west, seek, for the most part, to avoid the Gulf Stream, either by going to the north, or by taking what is called the southern route, which is very common, especially in winter. So that steamers, when in the lane going to Europe, will find the vessels generally all bound the same way, and likewise in the lane coming to America, the vessels seen, though not so many, will, for the most part, be steering to the westward. And when all are bound the same way, collisions are rare.

According to the tables given, the best routes for sailing vessels to Europe, as there determined, run along, for the most part, south of the line going, until you reach the meridian of 45°, between which and 40°, they cross this lane and run along between it and the other. These are the tracks that are projected on the Plate appended.

I will close this report with a recapitulation as to distances and courses by each lane, between New-York, Halifax, and Philadelphia on one side, and Cape Clear and the Scilly Isles on the other; first begging leave to say that, according to my computation, founded on such statistics as I have touching the velocity of the Gulf Stream, if two steamers bound for Cape Clear, and of exactly equal speed, were to start from Halifax, to see which should first get into the great circle part of the lane to Europe from New-York, and if one were to go straight for it by steering east, and the other were to follow the European lane from Halifax as projected on the Chart, this one would reach the point of destination quite as soon as the other, the drift of the Gulf Stream compensating for the greater distance.

DISTANCE BY LANE TO AMERICA.

			By Great Circle.
From Scilly Isles to	Halifax	2,351	2,305
" "	Capes of Delaware	2,948	2,909
" "	Sandy Hook	2,882	2,840
From Cape Clear to	Halifax	2,192	2,170
" "	Capes of Delaware	2,789	2,765
" "	Sandy Hook	2,723	2,695
" "	Do. by actual average	——	2,754

This statement shows that by the lane to America the distance is actually shorter, both to Sandy Hook, and, we may infer also, to the Delaware, than the average distance by present route; for the route actually pursued by the steamers now, both to Sandy Hook and the Delaware, may be considered the same from Cape Clear or the Scilly Isles, as far west as lon. 70°.

DISTANCE BY LANE TO EUROPE.

	To Scilly Isles.	To Cape Clear.
From Halifax	2,436	2,285
" Capes of Delaware	3,024	2,873
" Sandy Hook	2,980	2,829

Besides the detour from the great circle which a vessel from New-York, Halifax, Boston, or Philadelphia would necessarily make by following the European lane to Cape Clear, it would require an *additional* detour of only 15 miles for vessels bound into the English Channel to use it also as far as Cape Clear. This lane, therefore, will, in consequence of the favorable currents of the Gulf Stream, put a vessel into Southampton quite as soon as

she could reach that port from New-York or Philadelphia by the great circle route. Vessels from Halifax will have to make the greatest detour of any by adopting the lane to Europe; but for them it is less than 100 miles out of their way as they now go, and it will prolong their average passage eastwards, perhaps, two or three hours. I say *perhaps*, because I am not sure but that the steamers from Halifax and New-England are set back by the cold current 20 or 30 miles on the route now used for the eastern passage. The Gulf Stream, even from where they will join it by this lane, will not set them forward, on an average, 40 or 50 miles at the least. It seems, therefore, that the attractions of this lane as it regards safety should more than outweigh the *probable* loss of an hour or two during the passage. When I speak of distances by the lanes, it should be recollected that the *middle* of the lane is meant, as per following table of courses and distances:—

LANE TO AMERICA.

		Course.	Distance.
From	Scilly Isles to Cape Clear* .... W.	33.07 N.	159 miles
"	Cape Clear to lat. 51.23, lon. 15.00	01.55 N.	187 "
"	lat. 51.23, lon. 15.00 to lat. 51.16 lon. 20.00	02.17 S.	187 "
"	" 51.16 " 20.00 " 50.56 " 25.00	06.05	189 "
"	" 50.56 " 25.00 " 50.23 " 30.00	09.50	193 "
"	" 50.23 " 30.00 " 49.36 " 35.00	13.41	199 "
"	" 49.36 " 35.00 " 48.33 " 40.00	17.45	207 "
"	" 48.33 " 40.00 " 47.15 " 45.00	21.08	216 "
"	" 47.15 " 45.00 " 45.38 " 50.00	25.10	228 "
"	" 45.38 " 50.00 " 45.00 " 51.45	27.13	83 "
"	"(*a*)45.00 " 51.45 " 44.10 " 55.00	19.45	148 "
"	" 44.10 " 55.00 " 42.40 " 60.00	22.27	236 "
"	" 42.40 " 60.00 " 41.42 " 65.00	14.34	231 "
"	" 41.42 " 65.00 " 40.30 " 70.00	17.45	236 "
"	" 40.30 " 70.00 Sandy Hook,	00.43 S.	183 "
"	" 40.30 " 70.00 to Capes of Delaware, W.	22.08 S.	249 "
"	"(*a*)45.00 " 51.45 to Halifax,	03.53 S.	503 "

LANE TO EUROPE.

		Course.	Distance.
From	Capes of Delaware to lat. 39.40, lon. 70.0 .. E.	10.46 N.	236 miles.
"	Sandy Hook to lat 39.40, lon. 70.0 ...... .E.	14.29 S.	192 "
"	lat. 39.40, lon. 70.0 to lat. 40.31, lon. 65.0,	12.24 N.	237 "
"	" 40.31 " 65.0 " 41.09 " 60.0	09.39	227 "
"	" 41.09 " 60.0 " 41.33 " 55.0	06.05	225 "
"	" 41.33 " 55.0 " 41.53 " 50.0	04.57	232 "
"	"(*b*)41.53 " 50.0 " 43.55 " 45.0	29.06	251 "
"	" 43.55 " 45.0 " 45.46 " 40.0	27.28	241 "
"	" 45.46 " 40.0 " 47.18 " 35.0	24.04	226 "
"	" 47.18 " 35.0 " 48.32 " 30.0	20.18	212 "
"	" 48.32 " 30.0 " 49.30 " 25.0	16.21	206 "
"	" 49.30 " 25.0 " 50.14 " 20.0	12.46	199 "
"	" 50.14 " 20.0 " 50.45 " 15.0	09.17	192 "
"	" 50.45 " 15.0 to Cape Clear " E.	04.34 N.	189 "
"	Cape Clear to Scilly Isles................ E.	27.39 S.	151 "
"(*b*)	Halifax to lat. 43.30, lon. 60.00........ E.	20.07 S.	163 "
"	lat. 43.30, lon. 60.00 to lat. 42.30, lon. 55.0	15.17	181 "
"	" 42.30 " 55.00 " 41.53 " 50.0	09.28	225 "

* The courses and distances are for the *middle* of the lanes. See Charts.

Thus it appears that one lane will practically shorten the distance from Cape Clear to Sandy Hook and the Delaware, by 30 miles, while the other prolongs the distance going to Europe 75 miles, which prolonged distance, when measured not by safety, but *in time* alone, the Gulf Stream, better weather, and diminished frequency of fogs, will more than compensate for. In my judgment, these lanes, if properly followed, will make the average length of passage, as determined by the mean of all for the year, probably less each way, certainly not more than an hour or two longer than it now is. Individual passages coming will perhaps not be made so quickly as they have been, but on the average, trips will be shortened.

For a better understanding of the whole subject, I beg to refer to the Plate and Chart appended, and have the honor to be, gentlemen,

Yours, respectfully,

M. F. Maury,

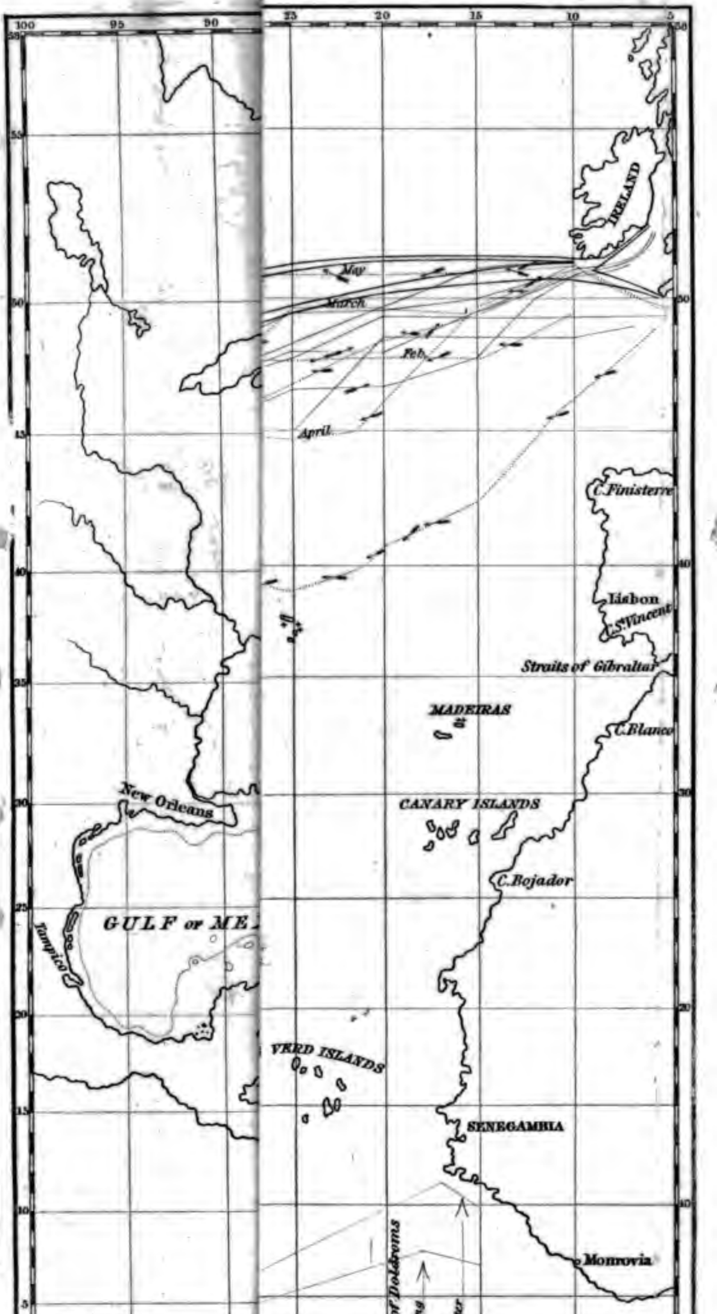
Lieut. U. S. Navy.

THE PRESENT SPIRIT OF NAVIGATION.

[*From R. B. Forbes's "New Rig for Ships."*]

Great progress has been made, within the last twenty-five or thirty years, in the equipment and fit-out of the merchant ships of the United States, and particularly during the last five years. In consequence, ships are now more easily managed by smaller crews than formerly.

The adoption of chain cables, looked upon at first with distrust, is universal; iron trusses, iron futtock shrouds, iron bands to yards, friction roller-sheaves, patent steering-gear, ventilators, and many smaller articles, have come into general use. The labor of fitting and working ships is much reduced. The rigger, with his mass of "puddings," "mousings," "cat-harpings," "bentick shrouds," "top-burtons," rolling tackles," buoys and buoy-ropes, has been obliged to give way, in a great measure, to the blacksmith. Jack is almost ready to go to sea for the love of it; and insurance offices are only kept open for lounging places, where the newspapers and the gossip of the day may be indulged in—the President and Directors occasionally putting their hands in their pockets to pay for some old ship that should have been condemned before starting! Chronometers, barometers, and thermometers, have crowded out lunars, azimuths, and amplitudes. Heaving the lead has become a matter of tradition; the commander who makes the best passage is the best


IRELAND
May
March
Feb.
April
C.Finisterre
Lisbon
C.St.Vincent
Straits of Gibraltar
MADEIRAS
C.Blanco
CANARY ISLANDS
C.Bojador
New Orleans
GULF OF ME
Tampico
VERD ISLANDS
SENEGAMBIA
Monrovia
Shape of Doldrums
in Spring
in Winter
dro Rocks
D. McClelland Sc.

fellow, no matter what risk he runs. The everlasting spirit of go-a-head-ism rules paramount. Seamen, however, have not improved, except in the important matter of temperance, in the same ratio that ships and their rigging have improved. I speak more especially of the Jacks. The old pig-tail Agamemnons, the Sons of Trafalgar, and the younger Sons of Victory, who sailed and fought with Bainbridge, Hull, and others of our own side of the Atlantic—the old privateersmen, full of oaths, tobacco, and rum,—all are gone! And in many respects, it is fortunate that we know them no more. But they had their uses; and, generally speaking, always, when sober and at sea, they were *sailors* of the first water, ready and expert to obey any orders against an enemy or against the elements. They were the men not to be ashamed of a reef taken in during the darkest squall; they could straighten out their twelve or fifteen fathoms of line, and melodiously sing the "marks" and "deeps;" they had a religious pride in saying, "Ay, ay, sir!" to every order, and generally in obeying any seamanlike demand. In short, half a dozen of them in a gale of wind were worth ten of the men now rating as seamen.

One great cause of this falling off in the quality of marlin-spike sailors is the discovery of gold in California. Another prominent cause is to be found in the greatly-increased competition among shipowners, whereby economy is necessarily the first object. It is becoming unfashionable to have ships come and go in what once was considered fine order. The freight-list is the great object. It is very seldom that the eye is gratified with a ship coming into port looking neat and trim about her spars and rigging. The booming-gun, at departure and on arrival, is no longer heard. Everybody goes and comes back, no matter what part of the world he has been to, without causing any remark. The levelling power of steam has told the story of his ship's loading, her time of sailing, &c.; the profit, or more likely the loss, on the cargo, is already calculated; the arrival of the ship is a mere fact to hear all about in the news-room. No one asks or cares whether she looks well or ill; her sails may be clewed up, and left hanging for a week in such style as would make an old tar weep, or she may be as trim as

any of the old Unions, Georges, Zephyrs, or Panthers; nobody cares. From my country residence, I daily see ships coming and going—gallant ships, well commanded, well officered, and only pretty well manned; and many of them carry the spirit of economy so far that they do not show their national flag. Ships meet on the ocean now-a-days, and pass each other by, without showing bunting, or asking a question, unless it be about the price of cotton, or the value of freight. "What is your longitude?" "Are you in want of anything?" "Pleasant passage to you," and "Report me, on arrival; all well,"—are expressions no longer known to the language. If a man ask the first question, he is considered a fool; he is lost, and don't know where he is! If the second, he would be considered even less wise, and entirely opposed to the owner's interest; and, as for reporting him, steam will do that long before he gets home. All these little nothings combine to depreciate the quality of the sailor; the inducements to commerce at home, render the sailor's vocation less popular daily; discipline is no longer maintained as formerly, and we are getting slip-shod.

CURRENTS OF THE SEA.

FROM LIEUT. MAURY'S WIND AND CURRENT CHARTS, 1854.

In studying the system of oceanic circulation, I have found it necessary to set out with the very obvious and simple principle, viz.: that from whatever part of the ocean a current is found to run, to the same part a current of equal volume is obliged to return. Upon this principle is based the whole system of currents and counter-currents of the air as well as of the water. It is not necessary to associate with oceanic currents the idea that they must of necessity, as on land, run from a higher to a lower level. So far from this being the case, some currents of the sea actually run up-hill, while others run on a level. The Gulf Stream is of the first class. In a paper read before the National Institute, in 1844, I showed why the bottom of the Gulf Stream ought, theoretically, to be an inclined plane, running *upwards*. If the Gulf Stream be 200 fathoms deep in the Florida

Pass,* and but 100 fathoms off Hatteras, it is evident that the bottom would be uplifted 100 fathoms (400 rather) within that distance, and, therefore, while the bottom of the Gulf Stream runs up-hill, the top preserves the water-level, or nearly so, for its banks are of sea-water, and being in the ocean, are themselves on a water-level.

The currents which run from the Atlantic into the Mediterranean, and from the Indian Ocean into the Red Sea, are the reverse of this. Here the bottom of the current is probably a water level, and the top an inclined plane, running *down-hill.* Take the Red Sea current as an illustration. That sea lies for the most part within a rainless and riverless district. It may be compared to a long and narrow trough. Being in a rainless district, the evaporation from it is immense; none of the water thus taken up is returned to it, either by rivers or by the rains. It is about 1000 miles long; it lies nearly north and south, and extends from latitude 12° or 13° to the parallel of 30° north.

I am not able to state the daily rate of evaporation there;†

* Recent soundings show the depth to be 500 fathoms.

† I learn from Johnston's beautiful Physical Atlas, that "from May to October, in the upper part of this sea, the water is two feet lower than in the other months;" and this he accounts for by the wind, which is said to prevail from the northward there, during this season of the year. This is the hot season; it is the season when evaporation is going on most rapidly; and when we consider how dry and how hot the winds are which blow upon this sea at this season of the year, we may suppose the daily evaporation to be immense; no less, certainly, than half an inch, and probably twice that amount. We know that the waste from canals by evaporation in the summer time, is an element which the engineer, when taking the capacities of his feeders into calculation, has to consider. With him it is an important element; how much more so must the waste by evaporation from this sea be, when we consider the physical conditions under which it is placed; its feeder, the Arabian Sea, is a thousand miles from its head—its shores are burning sands—the evaporation is *ceaseless;* and none of the vapors, which the scorching winds blow over it and carry away, are returned to it again in the shape of rains.

The Red Sea vapors are carried off and precipitated elsewhere. The depression in the level of its head waters in the summer time, it appears to me, is owing quite as much to the effect of evaporation, as to the effect of the wind in blowing the waters back from it into the ocean. Analysis will probably show the surface water at the head, and the deep sea-water at the mouth, to be salter, and therefore heavier, than are the surface-waters at the mouth of the Red Sea. Philosophers will acknowledge, in grateful terms, the services of any traveler by the overland route to India, who will collect specimens of these waters, and afford chemists an opportunity of testing them.

but it may be safely assumed—and for the illustration, I will assume it—at the rate of two-tenths (0. 2 in.) of an inch a day.

Now, if we suppose the current which runs into that sea to average from mouth to head 20 miles a-day—and this is conjecture merely, but for the purpose of illustration also—it would take the water fifty days to reach the head of it. If it lose two-tenths of an inch from its surface, by evaporation, it would appear that, by the time it reached the Isthmus of Suez, it would have lost ten inches from its surface.

Thus, the waters of the Red Sea ought to be lower at the Isthmus of Suez, than they are at the Straits of Babelmandel. They ought to be lower from two causes, viz.: evaporation and temperature—for the temperature of that sea is necessarily lower at Suez, in latitude 30°, than it is at Babelmandel, in latitude 13°. To make this quite clear: suppose the channel of the Red Sea to have no water in it, and a wave ten feet high to enter the Straits of Babelmandel, and to flow up its channel at the rate of twenty miles a-day, for fifty days, losing daily, by evaporation, two-tenths of an inch; it is easy to perceive that, at the end of the fiftieth day, this wave would not be so high, by ten inches, as it was the first day it commenced to flow. The top of that sea, therefore, may be regarded as an inclined plane, made so by evaporation.

But the salt water, which has lost so much of its freshness by evaporation, becomes salter, and, therefore, heavier. The lighter water at the Straits cannot balance the heavier water at the Isthmus, and the colder and salter, and therefore the heavier water, must either run out as an under-current, or it must deposit its surplus salt in the shape of crystals, and thus gradually make the bottom of the Red Sea a salt bed; or it must abstract all the salt from the ocean—and we know that neither the one process nor the other is going on. Hence, we infer that there is from the Red Sea an under or outer-current, as from the Mediterranean through the Straits of Gibraltar. Analysis would probably show the surface-waters at the head, to be salter than those near the mouth of the Red Sea, and it is hoped that some of my fellow-laborers in the Red Sea trade, will collect specimens of its waters, and afford us an opportunity of testing them.

And, to show why there should be an outer and under-current from each of these two seas, let us suppose the case of a long trough, opening into a vat of oil, with a partition to keep the oil from running into the trough. Now, suppose the trough to be filled up with wine, on one side of the partition, to the level of the oil on the other. The oil is introduced to represent the lighter water, as it enters either of these seas from the ocean; and the wine, the same water after it has lost some of its freshness by evaporation, and, therefore, has become salter and heavier. Now, suppose the partition to be raised, what would take place? Why, the oil would run in as an upper-current, overflowing the wine, and the wine would run out as an under-current.

The rivers which discharge in the Mediterranean are not sufficient to supply the waste of evaporation—and it is by a process similar to this, that the salt which is carried in from the ocean is returned to it again; were it not so, the bed of that sea would be a mass of solid salt. The equilibrium of the seas is preserved, beyond a doubt, by a system of compensation as exquisitely adjusted as are those by which the "music of the spheres" is maintained.

I have also on a former occasion pointed out the fact, that inasmuch as the Gulf Stream is a bed of warm water, lying between banks of cold water—that as warm water is lighter than cold—therefore the surface of the Gulf Stream ought, theoretically, to be in the shape of a double inclined plane, like the roof of a house, down which we may expect to find a shallow surface or roof-current, running from the middle towards either edge of the stream. The fact that this roof-current does exist, has been fully established. A person who has been engaged on the Coast Survey with observations on the Gulf Stream, informed me that, when he tried the current in a boat, he found it sometimes east and sometimes west, but scarcely ever in the true direction; whereas the vessel, which drew more water, showed it to be constantly in a north-easterly direction. My object at present is, not to account for the currents of the Atlantic, but merely to mention the fact, to call attention to it; that, though there be well-known currents which bring immense

volumes of water *into* the Atlantic, we know of none which carry it out again, and which, according to the principle with which I set out, ought to be found running back from that ocean.

The La Plata and the Amazon, the Mississippi and the St. Lawrence, with many other rivers and several large oceanic currents, run into this very small ocean, and it is not probable that all these waters are taken up from it again by evaporation; "yet the sea is not full." Where does the surplus go? The ice-bearing current, from Davis' Straits, which is counter to the Gulf Stream, moves an immense volume of water down towards the equator. The ice-bearing current which runs from the Antarctic regions, and passes near Cape Horn into the Atlantic, and the Lagullus current, which sweeps into it around the Cape of Good Hope, both move immense volumes of water also, and bear it along also towards the equatorial regions of the Atlantic. This water must get out again, or the Atlantic would be constantly rising.

A part of the Gulf Stream runs around North Cape into the Arctic Ocean. The thermal charts of the Atlantic Ocean, now in process of construction, prove this, as do also the admirable charts of Prof. Dové, of Berlin. This current around North Cape probably performs the circuit of the Arctic Ocean, and returns to the Atlantic with increased volume. There are the rivers of Northern Europe, and all the great rivers of Asia and America, that empty into the Frozen Ocean; also the current from the Pacific Ocean, through Behring's Straits. All these sources of supply serve, in my opinion, to swell the current down from Baffin's Bay through Davis' Straits into the Atlantic. Now does all this water escape from this ocean again, is the question? That there is an open water communication, sometimes at least, from Behring's Straits to Baffin's Bay, has been all but proved by the results of investigations undertaken about three years ago, at the National Observatory, with regard to the habits, migrations, etc., of the whale. These researches were commenced at this office by Lieutenant Herndon, and they were conducted in such a manner as to show, by a glance at the chart in what parts of the ocean, and in what months of the year,

whales had and had not been seen. These investigations soon led to the discovery, that to the right whale, the equator is as a wall of fire—that that animal is never found near it, seldom or never within a thousand miles of it, on either side. This fact induced me to inquire of the whalemen, whether the right whale of the northern, and the right whale of the southern hemispheres was the same animal. The answer was "No." The right whale of the latter region, as described by these men, is a small, pale animal, the largest scarcely yielding more than fifty barrels of oil. Whereas, that of the northern region is a large dark animal, yielding frequently to the single fish upwards of two hundred barrels. About this time the whale-ship Superior returned from a voyage through Behring's Straits, where she also found the right whale of the North Pacific. This fact induced the further inquiry, as to whether the right whale of Behring's Straits, and the right whale of Davis' Straits, were the same animal. For since the fact had been established that the right whale of the North Pacific could not cross the equator, and, therefore, could not get into the North Atlantic by either of the Capes, a reply in the affirmative to this inquiry would be another link in the chain of circumstantial evidence, going to prove the existence of a so-called north-west passage.

The answer from the whalemen in this instance, was in effect: "We have not had an opportunity of comparing the two animals, except after long intervals; but, so far as we can judge, they are the same fish." So far as other facts go, it would appear probable that there is, at times, at least an open water communication between the two straits; for the instincts of the whale, one might suppose, would prevent him from sounding under icebergs, neither could he pass under barriers of great depth or breadth. Seeing that water runs through Behring's Straits from the Pacific, as well as around the Capes, into the Atlantic, where, therefore, is the escape-current from the Atlantic?

The trade-winds, I am prepared to show, are the great evaporating winds. They are the winds, which, returning from the polar regions, deprived of all the moisture which the hyperborean dew-point can compress from them, first come in contact with

the surface of the earth, (and consequently with an evaporating surface,) where they are first felt as trades, and where, therefore, they are dry winds. Now, could the vapor taken up by these winds so increase the saltness of this sea in the trade-wind region, as to make the water there, though warmer, yet specifically heavier than that below, and also than that within the regions of the variable winds, and of "constant precipitation?" If so, might we not have the anomaly of a warm under-current in the South Atlantic Ocean? for that almost seems to be the only place of escape for a counter-current from the Atlantic.*

Lieut. Walsh, of the Schooner Taney, and Lieut. S. P. Lee,

MAIL STEAMER GEORGIA,
Off Havana, March 31, 1852.

*DEAR SIR :—On the 26th of March, we crossed the Gulf Stream, and when in latitude 34° 55′ N. and longitude 74° 08′ W., at 11, A. M., with a moderate S-W. breeeze blowing, temperature of air in the shade 69° 5′, I put the thermometer in a bucket of surface water; after two minutes immersion, it stood at 74° 5′. I then proceeded to the main-deck, to wash a deck-pump, which receives its water 6½ feet below the surface. Here I pumped 8 buckets of water, and in the 9th placed the thermometer, which, after two minutes immersion, stood steady at 79°. I went then to the hold, and opened a cock 16½ feet below the surface, and allowed it to run a full clear stream into the hold for fifteen minutes. This I did that the cock and pipe might take the temperature of the water, and thus prevent the heat of the ship from affecting the water, whose temperature I desired to take. After it had run fifteen minutes, I drew a wooden bucket full, in which I placed the thermometer as before. After two minutes entire immersion, it stood 86° 5′, thus showing clearly and conclusively a difference between the surface-water and that at the depth of 16½ feet, of 12 degrees. These results I can assure you are exact, as the observations were several times repeated without difference, and I am confident that the water whose temperature I tested, was in no degree affected by the heat of the vessel, I so carefully guarded against it. This is the only time that I have been in the strength of the Gulf Stream; but yesterday, the 30th, in latitude 24° 10′, longitude 80° 11′, (which you will perceive by the chart, and which the observation itself proves, does not place us entirely within the influence of the Stream, but very near its edge,) I took another set of temperatures. The thermometer stood in the shade at 79°, surface-water was 78°, and water from the depth of 16½ feet stood, after a fair and deliberate trial, at 79° 5. The water from the 6½ feet pump I did not try, as there was so much sea on, that there could be no certainty whether it came from the surface, or twelve feet below. I have had no further opportunities for observations of this character than these; but I hope that these, scanty as they are, may be gratifying to you.

Very truly yours,
A. C. JACKSON, U. S. N.,
Acting Master Cal. Com.

M. F. MAURY, *Superintendent of the Observatory.*

of the Brig Dolphin, who were sent out by the government, to make certain observations in connection with these researches concerning the winds and currents of the ocean, were, at my request, instructed among other things to examine for such a current. But neither of these officers had an opportunity of making the examination. It is hoped that a suitable opportunity will soon occur, and that advantage will be taken of it.

PRIORITY OF DISCOVERY OF HEARD'S ISLAND.

ENGLAND TOO LATE FOR HONORS.

We notice in the April number of the *British Nautical Magazine*, no less than four ship-masters, each claiming for himself, and probably ignorant of the claims of the others', priority in the discovery of some islands on the route to Australia, in about lat. 53° S., long. 73° 4′ E. The first in order of the English claimants is Capt. M'Donald, of the "Samarang," who saw them 3d January, 1854. Then comes Capt. Hutton of the ship "Earl of Eglinton," who saw them 1st December, 1854; and then Capt. Hyde, of the Royal steamship "Argo," who saw them on the 3d and 4th of December, 1854; and lastly, Capt. Rees, of the ship "Sincluden Castle," who also saw them Dec. 4th, 1854.

The positions assigned, place these islands between the parallels of 52° 53′ and 53° 10′ S., and between the meridians of 72° 35′ and 74° 40′ E.

They are on the fair way to Australia, and it will be perceived by the accompanying letter from Lieut. Maury, that these are Heard's Island, which were discovered in 1853, and 39 days before Capt. M'Donald, by Capt. Heard, of the American bark "Oriental," and that the Superintendent of the Observatory made an official report of the discovery nearly a year ago, and asked that a man-of-war should be sent to complete the discovery and fix position.

National Observatory, *June 12th*, 1854.

Sir:—I have the honor to report, that in the abstract log kept for this office, by Capt. John J. Heard, of the American bark "Oriental," on a

voyage from Boston to Australia last year, mention is made of the discovery of an island as follows, viz.:—

"November 25th, 1853, lat. 53 26 S., long. 74 19 E., (noon) pleasant breezes and passing snow squalls, latter part clear; the first fine weather we have had for twenty days; at 8.30 A.M. made land; at first took it for icebergs, as no island is laid down on my chart, nor in the Epitome; at 11.20 A.M. the clouds cleared away around and over it, revealing an island; at noon, the eastern end bore per compass, N. by W. about 20 miles. By good observations, I make the west end of the island in 74 15 E., long., east end, 74 40, lat. 53 10 S. Near the centre of the island a high peak, 5,000 feet high; large number of birds."

Capt. Heard sends me a sketch of the island, which, in the exercise of the rights, which usage gives to discoverers, he claims for the United States, and call's Heard's Island.

I perceive by a slip copied in the Hobarttown *Argus*, from the Sydney *Morning Herald*, that Capt. M'Donald, of the "Samarang," who passed near the same place 39 days after the "Oriental," viz.: Jan. 3d, 1854, also reported land in the same vicinity, viz.:—M'Donald's Isle, lat. 53 00 S., long. 72 35 E. Young's Island, lat. 54 03 S., long. 73 31 E.

The nearest land to this, known to hydrographers, is "Kerguelen Land," which is about 300 miles to the N.N.W.; the difference of latitude being nearly four degrees. It can hardly be supposed, therefore, that one could be mistaken for the other.

There is a vast amount of shipping engaged in the Australia trade, and according to the best route, as indicated by the wind and current charts, this reported discovery lies in the fair way of outward-bound vessels, both from this country and Europe, to the ports of Australia; and doubt as to the existence or position of dangers in such a commercial thoroughfare as this is, should not be suffered to remain a day too long.

Heard's Island may, perhaps, prove valuable to the sealing interests. I hope the department will find it convenient to have all doubt, as to its place and existence, removed at an early day.

I beg leave in this connection to say, that the vessels, which, by the act of Congress of March 3d, 1849, the Secretary is authorised to employ, "in testing the new routes, and perfecting the discoveries," made in the course of the investigations carried on at this office, could now be employed with great advantage.

Respectfully, &c.,

(Signed) M. F. Maury.

Hon. J. C. Dobbin,
Secretary of the Navy,
Washington, D. C.

THE CLIPPER-SHIP NIGHTINGALE *vs.* THE FLYING SCUD.

TIME, the unwearied messenger that always brings truth to light in his own good season, has disclosed a discrepancy in the accounts of the performances of the clipper-ship "Flying Scud," which has given rise to the following correspondence from a firm friend of the fine ship "Nightingale." Desiring to be among the first to herald the extraordinary speed alledged to have been attained by the "Flying Scud," during a run of 16 consecutive days, and to announce the short and successful voyage which she actually did make, we availed ourselves of the best information at hand, which was believed by her builders, owners, and shippers, to be true and reliable, to compose the article referred to by our spirited correspondent. We give place to his remarks with pleasure, and would also refer the reader to the particulars of the "Flying Scud" in another article of the present number. Our motto is—

An open sea, and a flowing sail,
A clipper ship, and a driving gale;
A golden broom to the gallant mast,
That fearless "sweeps" all the ocean vast.

BOSTON, May 12, 1855.

MESSRS. GRIFFITHS & BATES:—

Gentlemen:—In your May No. is an article headed "Maine Carries the Broom," "Extraordinary Sailing," in which you give the speed of the famous ship Flying Scud, on her recent passage from New-York to Melbourne, as unequalled, having, as you state, made the passage in 75 days, and made 6,420 nautical miles in 16 consecutive days. Would that this was all true; but inasmuch as it is all false, I must ask your permission to take the wind out of the sails of the ship Flying Scud, and to haul down the "*broom*" from her mast-head. You promise your readers particulars in your next. Not doubting for a moment your anxiety to make your famous NAUTICAL MAGAZINE one of great reliability for all the statements therein contained, I propose to give you some of the particulars to enable you to furnish the same to your readers, as a matter of record. For this purpose I now hand you the log of the ship Flying Scud, as furnished the Melbourne *Argus*, 20th December, 1854, by the surgeon of the ship, S. J. Stratford, Esq., who gives the passage as 80 days, and not 75. This must settle the point about the passage not being the shortest, by several days; the good ship Nightingale having made the passage, from anchorage to

anchorage, New-York to Melbourne, in 75 days 16 hours, being the shortest on record.

As to this amazing distance that the Scud made, there is a trifling mistake, supposing it to be unequalled. I sent the figures to Lieut. Maury, at Washington, and you may judge of my surprise, when I received a letter from him, stating that the surgeon had committed the trifling error of stating his distance run to be 6,420, instead of 4,620 miles, as shown by the actual difference of latitude and longitude furnished—as proof of this I now send you Lieut. Maury's letter,* and you can in a few minutes prove the fact of his statement by your own figures. The passage is a very fine one, and the distance of 4,620 miles, a splendid run, in 16 days, should satisfy the owners and others interested, without trying to stretch the truth.

By giving the foregoing to the public, with any part of the log which I now send you for your inspection, which you may think of interest to add hereto, you will oblige,

Gentlemen,
Your friend and servant,
S. ——, of Boston.

PASSAGE OF THE "FLYING SCUD."

The following account of the passage of the "Flying Scud," appears to have been communicated to the Melbourne *Argus*, by the surgeon of the ship, and which gave rise to the errors which I have pointed out above:

"Arrival of the Flying Scud.—The clipper-ship 'Flying Scud,' Capt. W. A. Bearce, one of Mr. R. W. Cameron's celebrated Pioneer Line of Australian Packets, sailed from New-York, with one hundred and forty passengers, on Thursday, September 28th, crossing the Gulf-stream with a northerly breeze on the 30th September. At 8 P.M., the ship was struck by lightning. The first flash struck the ship forward, knocking down several men. One man was brought into the cabin, incapable of standing from the shock, from which, however, he recovered in a short time. All felt their legs go from under them, and their nerves were greatly influenced by the electricity. The second flash struck the ship abaft the main and mizzen masts; this also knocked down most of the hands on deck, and, curious to

* Observatory, Washington, March 23, 1855.

Dear Sir:—Thank you for the "Flying Scud's" performance, received yesterday. The surgeon has a long gun certainly; but unfortunately for his story he gives us its dimensions by telling us the place from and to which the ship ran in 16 days—those 6,420 miles. According to Gunter, it should be 4,620. * * * *

Yours, &c.,
M. F. Maury.

Boston, Mass.

observe, it had a great effect upon the compasses. When first observed, the needle revolved with great velocity, and this continued for some time; when it ceased, the compasses were found to be considerably changed, and it was afterwards discovered that they varied five points to the eastward of their true bearing, which, after a lapse of five or six days, diminished to three points.

"These facts were clearly proved by the position of the sun and the bearing of the north star. In consequence of this derangement of the compasses, (five in number,) it was necessary to lay the ship to, under close-reefed topsails, for eighteen hours, although the wind was perfectly fair, and the ship might have run one hundred and fifty miles at least. It would appear that the lightning struck the mizzen-mast and descended by the lightning-rod to the channels. The wind appeared to blow the copper wire of the rod against the chains, and hence it was conducted through the bolt into the interior of the ship, where it magnetized a large quantity of iron and steel implements which were in the after hold. To prove that these were the seat of attraction, Capt. Bearce placed a compass in all parts of the ship. The influence varied in different places. On the top-gallant forecastle the compass seemed somewhat to return to its proper bearing; abaft the mainmast the influence was much stronger; and in the after part of the ship it was most potent. Placed upon the cabin floor, the compass still revolved with considerable velocity. On a board, placed ten feet out upon the larboard side of the ship, the compass was found to become nearly correct; by this means the true course of the ship was found. The influence above-mentioned prevailed during most of the passage, until the 7th December, in lat. 43 45 S., and long. 110 15 E., when the compass seemed to become more correct, being found to vary but ¾ of a point to the eastward.

"It is also worthy of notice that in this region several claps of thunder, with lightning, were heard, and that these were followed by thick foggy weather, which precluded the possibility of any observation for four days. When this was obtained, the ship was found to be 150 miles to the southward of her true course, in consequence of steering by the compass, supposing it to possess the same variation which has just been mentioned; but when observation was obtained, the compass was found to have returned to its true bearing, and thus was the course of the ship deranged, and her voyage unnecessarily protracted.

"On the 1st of October, after the true bearing of the compasses had been determined, sail was made with a northerly wind, and the ship reached the region of the north-east trades on the 12th October, but found only light airs and baffling winds from southward and eastward. The south-east trades, however, were reached on the 23d of October, in lat. 5 18 N., and long. 30 27 W.; these proved strong whole-sail breezes, and kept with the ship until Thursday, November the 5th, in lat. 27 41 S., and

long. 29 30 W. The ship was then steered eastward, with strong northerly and westerly breezes, the ship often going fifteen or sixteen knots in the hour. On Monday the 6th of November, the ship run the very large amount of 449 nautical miles in the 24 hours. After some calms, and occasional gales from the eastward, which continued until the ship arrived on the 12th of November, in lat. 32 48 S., long. 5 3 E., when she again obtained strong gales from the westward, (these were evidently the westerly passage winds laid down in Lieut. Maury's Sailing Directions,) and continued with the ship, with but slight intermissions, until she arrived in lat. 42 30 S., long. 139 E., on the 10th December.

"On the 24th November the ship was in 45 47 S., and long. 32 6 E., and arrived, as before stated, on the 10th December, in long. 139 E., running the immense amount of 6,420 nautical miles in 16 continuous days, thus averaging upwards of 400 miles per day. Taken as a whole, this voyage of the 'Flying Scud' appears to have been one of the most successful attempts at speedy navigation accomplished by any vessel out of New-York, going eastward, since a due appreciation has been had of circular sailing, so beautifully and elaborately detailed by Lieut. Maury, United States Hydrographer; it was accomplished by the 'Flying Scud,' under very considerable disadvantages, viz.: she being two feet out of trim, having a very heavy deck-load, and being extremely crank upon a side wind, which precluded the possibility of carrying the amount of sail that she was otherwise able to do.

(Signed) "JOHN STRATFORD,
"Surgeon, &c.

"N.B.—It should have been noticed that the 'Flying Scud' crossed the Equator on Tuesday, 26th October, in long. 32 41 W.; at the same time, it should be remarked that, notwithstanding, the compass appeared to have a true bearing in long. 39 E., lat. 42 30 S., it again became deranged in long. 143, lat. 41 3 S. This time the variation was 2½ points to the westward, and this variation has continued, and may still be observed on board the ship. *Passage* 80 *days.*

(Signed) "S. J. STRATFORD,
"Surgeon, &c."

A NEW NAUTICAL INSTRUMENT.—Mr. Hall Colby, of this city, a name already favorably known to the maritime world, in consequence of his inventions in connection with ships compasses, has recently invented and put in use, a device for taking the altitude and zenith distances of the heavenly bodies, without reference to a horizon. The instrument acts on the principle of a plumb bob, as one prominent portion consists of light disc, delicately mounted, and loaded on one side. Means are employed to prevent vibration, under any circumstances, and little skill is required in determining, within a few minutes, the correct altitude of any object which may be distinctly seen through the telescope. The great advantage of the instrument consists in its avoiding the necessity of a horizon, there being much weather, in which the sun, or north star, can be distinctly observed, but are of no avail with ordinary instruments, on account of a low haze or fog.

NOTICES TO MARINERS.

LIGHT-HOUSE AT BASS RIVER, NORTH SIDE OF VINEYARD SOUND, MASS.—A light-house has been erected at Bass River, on the north side of Vineyard Sound, and the light will be exhibited for the first time on the evening of the 1st May next, and on each succeeding day from sunset to sunrise. The apparatus is of the 5th order, fixed, of the system of Fresnel, illuminating an arc of 180° of the horizon.

The tower is placed on the centre of the keeper's dwelling. The tower and dwelling are painted white, and the top of the lantern red. The light will be 40 feet above the mean level of the sea, and should be seen in ordinary states of the atmosphere, by an observer ten feet above the water, a distance of 10½ nautical miles.

The light will be visible from east around by south to west. Vessels approaching from the westward must bring the light to bear N. by E. to clear the east end of the breakwater, and those approaching from the eastward should bring the light to bear N. W. before running in for the anchorage.

By order of the Light-House Board.

TUCKERNUCK SHOAL AND SLUE BUOYS, VINEYARD SOUND, MASS.—Instead of the Buoy Boats on the end of Tuckernuck Shoal and Tuckernuck Slue, Nun Buoys have been placed.

The one on the shoal is painted red, with the number 10 upon it, and stands in 20 feet of water.

The other is placed on the south end of the slue, and stands in 12 feet of water. It is painted red, with the word SLUE upon it in black letters, and must be left on the starboard hand in going into Nantucket.

By order of the Light-House Board.

NORE LIGHT.—The following notice has been received at this office, and is published for the information of mariners.

THORNTON A. JENKINS,
Secretary.

TREASURY DEPARTMENT,
Office Light-House Board.

TRINITY-HOUSE, LONDON, 28*th March*, 1855,

The attention of this Corporation having been given to the difficulty which is now experienced of distinguishing the light exhibited on board the floating light vessel at the Nore, by reason of the lights which are shown on board of vessels at anchor in the vicinity thereof, in compliance with the authorized Admiralty Regulation, which requires that all vessels shall exhibit a bright light when at anchor, it has been deemed advisable that the character of the floating light at the Nore should be changed; and

Notice is hereby given,

That, on or about the 21st June next, the light at the Nore will *cease to be exhibited as a fixed light*, and that a revolving light, showing a flash of bright light, at intervals of thirty seconds, will be exhibited instead thereof.

J. HERBERT,
By order. *Secretary.*

CHANGE OF LIGHT AT COVE POINT, NORTH OF MOUTH OF PATUXENT RIVER, CHESAPEAKE BAY.—Notice is hereby given, that the present fixed light at Cove Point will be changed, on or about the 15th of June next, to a fixed light, varied by flashes.

The light will be produced by a 5th order catadioptric apparatus; will be of the natural color, fixed, with a bright flash at intervals of one and a half minutes.

By order of the Light-House Board.

IRELAND, RIVER SHANNON, FIXED LIGHT ON THE BEEVES ROCK.—Official information has been received at this office that the Port of Dublin Corporation has given notice, that on the 14th of May inst., (1855,) a fixed light will be established on the Beeves Rock, in the River Shannon.

The light tower stands on the southwest side of the Rock, in lat. 52° 39′ north, and long. 9° 1′ 18″ west of Greenwich, and bears from Foynes Island (north shore) E. ¾ S. dist. 3½ miles, from Herring Rocks (north point) N. N. E. dist. ¾ mile, and from Carrig Keal, W. ¾ N. dist. 4 miles.

The light will be a *fixed* light, at an elevation of 40 feet above the level of high-water at spring tides, and should be visible from the deck of a vessel in clear weather at a distance of from 10 to 12 miles.

It will appear of the natural color, *bright*, as seen from the south or main channel of the river, between the bearings E. ½ N. and N. W. by W., or over an arc of 140° of the horizon, and colored *red* towards the passage northward of the Beeves Rock.

By order of the Light-House Board.

DEVAAR LIGHT-HOUSE.—Official information has been received at this office that the Commissioners of Northern Light-Houses have given notice that a light-house has been built opon the Island of Devaar, at the entrance to the Bay of Campbeltown, in the County of Argyll, the light of which will be exhibited on the night of Monday, 10th July, 1854, and every night thereafter, from the going away of daylight in the evening till the return of daylight in the morning.

The following is a specification of the Light-House, and the appearance of the Light, by Mr. David Stevenson, Engineer to the Commissioners:

The Light-House is in N. Lat. 55° 25′ 45″, and W. Long. 5° 32′ 16″.

The Devaar Light will be known to mariners as a *revolving light,* which shows a bright white light once every half-minute.

The light is elevated about 120 feet above the level of high-water of ordinary spring tides, and may be seen at the distance of about 15 nautical miles, and at lesser distances, according to the state of the atmosphere; to a nearer observer, in favorable circumstances, the light will not wholly disappear between the intervals of greatest brightness. The arc illuminated by this light extends from about S. ¼ E. by compass, to about W. by N. and faces northwards.

By order of the Light-House Board.

LIGHT-HOUSES AT TRAPANI AND AT ISOLA DI VULCANO, KINGDOM OF THE TWO SICILIES.—Official information has been received at this office, through the Department of State, that the Sicilian Government has given notice that on and after the evening of the 8th of February, 1855, in place of the old beacon on the Colombaja at Tripani, (lat. 38° 1′ 53″ north, and long. 10° 9′ 54″ east of the meridian of Paris,) there would be illuminated a catadioptric fixed light of the fourth order, with flashes every three minutes.

This light is elevated 139 feet above the level of the sea, and has a range of 14 nautical miles.

Also, that on Isola di Vulcano, at Punta del Rosario, (lat. 38° 20′ north, and long. 12° 34′ 50″ east of the meridian of Paris,) there would be illuminated, on March 8, 1855, a catadioptric light similar to the preceding one.

This light is elevated 458 feet above the level of the sea, and has a range of 14 nautical miles.
By order of the Light-House Board.

CHANGE OF THE DELAWARE BREAKWATER LIGHT.—On or about the 10th of May, the present Red Fixed Light of the Delaware Breakwater will be discontinued, and will be replaced by a Fresnel lens of the 4th order of 360 degrees, exhibiting *a white light, fixed, varied by flashes.*
By order of the Light-House Board.

BEACONS AND STAKES IN MOBILE BAY.—Under the act of Congress providing for the Buoyage and Stakeage of Mobile Bay, the following beacons have been erected:

Two Beacons ranging through Choctaw Pass, as formerly, and lighted at night.

One Beacon at the site of the "Wreck Stake."

One Beacon at the site of the "Upper Stake."

One Beacon at the site of the "Lower Stake."

Two Beacons to the south of the above, prolonging the line of channel at Dog River Bar.

All of the foregoing, except the range stakes, are to be left on the port hand when coming in.

A Day Beacon has also been placed on the end of the OYSTER BAR which runs out easterly from Cedar Point.

A Beacon on the West end of the spit at the entrance to Navy Cove.

A Beacon on the end of the shoal which runs out westerly from Point Clear, and

A Beacon on the West end of the small detached shoal south of the last-named point.

Each of these Beacons is composed of several piles driven together in a solid clump.

Vessels should take care not to run into them, not only for the Beacon's safety, but for their own.

The Light at Reedy Island Light-house, Delaware Bay, has been improved by placing a fourth order Fresnel Lens of 360 deg. No change in the character of the Light, which is a fixed light.
By order of the Light-House Board.

A Fixed White Light, of the sixth order Fresnel system, illuminating 276 deg. of the horizon, has been substituted for the illuminating apparatus heretofore in use at Cedar Island Light-House, entrance to Sag Harbor, N. Y. It will be lighted for the first on Friday, 27th inst., and exhibited nightly thereafter from sunset to sunrise.
By order of the L. H. Board.

Capt. Crooks of brig Putnam, reports that on the 9th of April last, in lat. 35° 01′N., lon. 43° 10′ 30″W., ran over a bank. Had a cast of the lead, and found less than seven fathoms. The shoal is one mile in extent from North to South, and one-fourth of a mile wide.

MISSING VESSELS.

Barque Amelia, Capt. Swanson, sailed from New-York about Feb. 17th, for St. Mary's, Ga., and had not arrived at last accounts.

Barque Magnolia, Capt. Marsden, sailed from New-York about March 5th, got ashore on Loo Key 20th, was got off and proceeded 24th, but had not arrived at last accounts up to 20th ult.

DISASTERS AT SEA.

STEAMERS.

Golden Age, San Francisco, struck a rock 5 miles from Panama, no lives lost.
Mohawk, (propeller,) Albany, for Hartford, wrecked on Saybrook Bar, Conn. River.

SHIPS.

Adriana, Bath, for New-Orleans, put into Nassau, April 9, leaking badly.
Southport, New-York, for Savannah, was ashore on the Knoll, April 21.
Argonaut, Hong Kong, for Shanghai, got ashore on the North bank.
Westmoreland, at Philadelphia, from Liverpool, lost 4 boats, some sails, &c.
Countess of Morely, Naples, for New-York, went ashore at Gibraltar, March 24.
Minona, Charleston, for Gothenberg, struck a rock, lost anchors, and leaking.
Tsar, Penang, for Singapore, was leaking.
Alma, for Boston, returned to the Clyde, leaky.
George Hurlbut, for New-York, put into Portsmouth, England, in collision, and lost fore-mast, bowsprit, &c.
James Guthrie, for Toulon, was seen off Cape Spartel, dismasted.
Miantonomi, (whaler) has been lost, no particulars.
Unknown, (clipper) was seen waterlogged, and abandoned, with lower masts standing.
Part of deck of a large ship was seen, lat. 31° 52′, lon. 77° 50′.
Oswego, New-York for New-Orleans, was totally lost on Stirrup Key, Barry Islands, April 8.
Carioca, Philadelphia, for Rio Janeiro, ashore below Wilmington, Del.
Lehroner, was ashore, April 21, inside Topsail Hold Inlet, 25 miles E. of Wilmington Bar.
Wm. T. Wheaton, of New-London, was totally lost, 60 miles south of San Francisco.
Cora Linn at Liverpool, in distress, for New-York, had 2 feet water in hold, and thrown over 150 tons iron.
John Rutledge, for New-York, put back to Liverpool, lost 2 of crew, part of cargo, sails, &c.
Cultivator, at Liverpool, dragged anchors, and got aground off Pier Head.
Fairlie, at Deal, from New-York, in a leaky condition.
Lady Franklin, at Falmouth, Eng., from Matanzas, much damaged, and leaky.
Henry Reed, from New-York, in contact with steamer Telegraph, at Antwerp, had stern damaged.
Matilda, broke adrift, at Antwerp, and received some damage.
Grace Ardrossan, for New-York, put into Queenstown, leaky.
J. R. Folsom, (new) Cardiff, for New-York, struck on the Hen & Chickens, and sank in 12 fathoms water.
Sierra Nevada, at Liverpool, had her back broken while being taken in the dock.
Simoon, at Liverpool, from New-York, got ashore at the East India docks, and leaks.
Jane Leech, from Manilla, in contact with the Sierra Nevada, at Liverpool.
Unknown, (1200 tons) clipper, was seen, May 1st, dismasted, waterlogged, and abandoned.
Margaret Scott, at New-Bedford, May 6, while going in grounded on Salter Point Rocks.
Living Age, (726 tons) was totally lost, Jan. 2, on Pratus Rocks, 150 miles from Hong Kong.
Unknown, was seen, April 25, on the Dog Rock, Fla, fore-mast standing.
Unknown, (clipper) was seen, April 27, lat. 42° 8′, lon. 53° 13′, waterlogged and abandoned.
Unknown, was seen, April 11, on fire, fast on Great Stirrup Key.
California, Boston, for Surinam, was seen making for Gloucester, leaky.

BARQUES.

Eastern Star, at Boston, from Palermo, sprung fore-mast, and started cutwater.
Unknown vessel was passed, April 18, lat. 33° 39′, lon. 63°, waterlogged, and abandoned.
Tremont, at Galveston, from Boston, lost deck load.
Velocity, at Gibraltar, from New-Orleans, lost an anchor and some cable.
Wieland, at New-York, from Bremen, lost some spars, sprung mainmast, &c.
Philah Shields, Eng., for New-York, put into Rockland, April 17, with loss of all sails.
Tangier, at Valencia, from New-York, with damage to both vessel and cargo.
Cherokee, Boston, for St. Jago, ran on N. E. end of Mayaguana Reef, April 11.
Island City, at Galveston, from Boston, lost all top-gallant-masts, and some sails.
15 vessels were seen ashore in the straits of Gibraltar, also many others, damaged in the gales of March.
Cavalier, for Stonington, got ashore, May 6, on Mutton shoal, not much damaged.
Nashua, at Boston, from Philadelphia, lost fore-top-mast.
Georgiana, at Boston, from Baltimore, lost main-top-mast.
Sarah Ann, at Charleston, from Newport, Eng., sprung mizen-mast.

BRIGS.

Globe, at Philadelphia, from St. Kitts, lost bulwarks, &c.
R. Patterson, was driven ashore in the Bay at Gibraltar, March 21.
Unknown, (Herm.) was seen, April 20, lat. 36.57, lon. 66, with taffrail above water.
Thomas F. Knox, St. Lucas, for New-York, lost mainsail, jibboom, &c.
Gazelle, for Cayenne, returned to Salem, April 18, leaking badly.

China, at Newburyport, from Havana, off Cape Hatteras, stove 63 hhds. molasses.
Thomas & Edward, at Savannah, from Rockport, Mass., lost bulwarks, stove boat, &c.
Delhi, for Port-au-Prince, returned to Philadelphia leaking badly.
E. Baldwin, at Boston, from Matanzas, lost 10 hhds. molasses, April 11.
Westport, Georgetown, S. C, for Damariscotta, was abandoned, April 21, lat. 34.24, lon. 75.
Advance, for Providence, returned to Charleston, leaking.
Unknown, was ashore 15 miles west of Fire Island, April 27.
Sarah, (British) burned to the water's edge, March 30, Carlisle Bay, Barbadoes.
Joseph Balch, at Boston from Palermo, lost some spars, and sprung bowsprit, &c.
Wanderer, (British) Windsor, N. S., for New-York, put into Newport, had been on Nantucket Shoals.
A. G. Washburn, at Bristol, R. I., from Port-au-Prince, in collision with a brig, and damaged considerably.
H. C. Brooks, at New-York, from Trinidad, stove boat, lost sails, &c.
Wilford Fisher, off St. Johns, N. F., from New-York, struck on the Northern Head.
Powhattan, at San Francisco, was run into by a ship, stove boats, and otherwise damaged.
Eliza W. Dalton, Port-au-Prince, for New-York, struck on Bird Key, April 25, and was afterwards condemned.

SCHOONERS.

Melville, New-York, for Pembroke, went ashore at Mt. Desert, L. I., and became a total wreck
Boston, Philadelphia, for Boston, went ashore on Cold Spring Bar, Cape Island.
Rockport, at Charleston, from Camden, stove boats, and received other damage.
Unknown, (large) was passed, April 19, off Absecom Inlet, with mast-heads just above w
Vesper, Baltimore, for New-York, lost mainmast in collision with a ship.
Granite Lodge, from Rockport, Mass., was lost on east side Hart's Island, April 21.
Marcellus, Calais, for Boston, went ashore at West Quoddy-head, April 11.
Kingfisher, at Maracaibo, was struck by lightning, and lost foremast.
Silver Cloud, at Savannah, from Norfolk, split sails, and threw over part of cargo.
Cora, Philadelphia, for Roxbury, Mass., went ashore inside of Cape May Light.
Volante, at New-York, from Guayanilla, is leaking 2000 strokes per hour.
Medomak, Calais, for Kennebunk, was run into, had bows stove, and afterwards abandoned.
Unknown, (100 tons) was passed 30 miles S. of Cape Elizabeth, foremast gone.
Agnes, at Liverpool, from Cardiff, ran foul of the Sirocco for Philadelphia.
Miranda, of Norfolk, was seen Mar. 1, lat. 25° 36', lon. 72° 40', both masts gone, and full of wate
Waterville, for Nantucket, was totally lost near Humane House, Provincetown, May 1.
Joseph Baker, for New-York, with lime, was burned, and sank, April 30.
Henry Atkins, for Jacksonville, is a total loss at Merlin, Md.
Increase, Attakapas, for New-York, was spoken off Cape Florida, leaky, April 29.
Golden Rule, York, Me., for Philadelphia, put into Nantucket, May 5, with 3 feet water in hold.
Manchester, (new, 240 tons,) Richmond, for New-York, went ashore, May 8, on Herford Inlet Bar.
Unknown, (80 tons) was seen on her beam ends, May 5, off Townsend's Inlet, abandoned.
Christiana, (cargo lime) Rockland, for Boston, took fire, and was sunk, a leak caused the fire.
Powhattan, (before reported Pocahontas,) Wareham, sprung aleak, April 27, and was grounded on Naushow.
John Clark, New-York, for Kingston, Jan., was lost, and 7 of the crew perished.
F. J. Bragnard, was run into and abandoned, was found in Little Egg Harbor, and towed to New York.
Madawaska, from Baltimore, grounded on the bar at St. Augustine, Fla.
Unknown, was in contact with Sch. Clara M. Porter, near Beverly, and sank.
Unknown vessel, (about 125 tons) was fallen in with, lat. 20 12 N, long. 92.12 W., waterlogged.
Medad Platt, at Newbern, N. C., from Boston, with lime, was on fire, and scuttled.
New-York, at Holmes' Hole, for Boston, cut away masts to save vessel.
Grecian, Philadelphia, for Boston, got ashore in a gale, at Holmes' Hole.
Warrenton, Hancock, Me., was run into by ship Miss Mag, and cut down, all hands saved.
Mary Carnes, New-York, for Mayaguez, Porto Rico, lost sails, boat, deck-load, &c.
Star, Surry, Me., for Boston, went ashore, May 9, at Scituate.
Senator, at Boston, from Frankfort, lost foremast, and sprung aleak.
Ontario, in crossing the Swash, was foul of the Sch. Laura E. Johnston, stove her bows in.
Hanover, was in contact, May 5, with Br. brig Venus, the latter fared worse.
Unknown was passed, May 14, near Fourteen Foot Bank, sunk, and all sails set.
Marcia Farrow, at New-York from Cienfuegos, got ashore on Jack Taylor's Reef.
Charger, at New-York, from Franklin, Lou., put into Key West, leaking.

MARINE.—GOOD NEWS FROM THE FLATS.—A letter from Captain Bantam, of the bark Canada, to her owners in this city, states that the bark had been towed over the St. Clair Flats, drawing 10 feet 2 inches water. This is better than was expected. The Canada is loaded with oats for this port, shipped last fall.—*Buffalo Republican, May* 25.

Commercial Department.

A REVIEW OF THE BRITISH TONNAGE LAWS.

(*Concluded.*)

At length, in 1833, a second commission was appointed, "To consider the best mode of Measuring the Tonnage of Ships." In the report of the Commissioners, printed February, 1834, they state, that the "Internal capacity will be the fairest standard of measurement, including all those parts of a vessel which, being under cover of permanent decks, are available for stowage;" and, "that a rule of such general application should depend on the smallest number of measurements necessary to give the figure of the hull, and that it should afford results sufficiently exact for the required purpose by an easy arithmetical process."

The following rules, constructed on the above principles, were recommended by the commission, and established by Act of Parliament in 1836. They are known as the rules of "New Measurement."

"RULE THE FIRST.

"FOR THE MEASUREMENT OF VESSELS FOR REGISTER TONNAGE WHILE THE HOLD IS CLEAR.

"Divide the length of the upper deck, between the after part of the stem and the fore part of the stern-post, into six equal parts.

"Depths.—At the foremost, the middle, and aftermost of these points of division, measure in feet and decimals the depths from the under side of the upper deck to the ceiling at the limber strake. In the case of a break in the upper deck, the depths are to be measured from a line stretched in a continuation of the deck.

"Breadths.—Divide each of these three depths into five equal parts, and measure the inside breadths at the following points, viz.: at one-fifth and at four-fifths from the upper deck of the foremost and aftermost depths, and at two-fifths and four-fifths of the midship depth.

"Length.—At half the midship depth measure the length of the vessel from the after part of the stem to the fore-part of the stern-post.

"Then to twice the midship depth add the foremost and the aftermost depths, for *the sum of the depths.*

"Add together the upper and lower breadths at the foremost division, three times the upper breadth and the lower breadth at the midship division, and the upper and twice the lower breadth at the after division, for *the sum of the breadths.*

"Then multiply the sum of the depths by the sum of the breadths, and ihts product by the length, and divide the final product by 3.500, which will give the number of tons for register.

"If the vessel have a poop or half-deck, or a break in the upper deck, measure the inside mean length, breadth, and height of such part thereof

as may be included within the bulkhead; multiply these three measurements together, and, dividing the product by 92.4, the quotient will be the number of tons to be added to the result as above found.

"In order to ascertain the tonnage of open vessels, the depths are to be measured from the upper edge of the upper strake.

"RULE THE SECOND.

"FOR THE MEASUREMENT OF LOADED VESSELS.

"Measure the length on the upper deck, between the after part of the stem and the fore part of the stern-post; also the inside breadth on the under side of the upper deck, at the middle point of the length; also the depth from the under side of the upper deck down the pump-well to the skin; multiply these three dimensions together, and divide the product by one hundred and thirty, and the quotient will be the amount of the register tonnage.

"If the vessel have a poop or half-deck, or a break in the upper deck, the tonnage thereof is to be found as in the foregoing Rule No. 1, and the number of tons added to the result above found.

"FOR THE MEASUREMENT OF STEAMERS.

"And in each of the two rules above prescribed, when applied for the purpose of ascertaining the tonnage of any ship or vessel propelled by steam, the tonnage due to the cubical contents of the engine-room shall be deducted from the total tonnage of the vessel as determined by either of the rules aforesaid, and the remainder shall be deemed the true register tonnage of the said ship or vessel; the tonnage due to the cubical contents of the engine-room shall be determined in the following manner:—Measure the inside length of the engine-room in feet and decimals from the foremost to the aftermost bulkhead, then multiply the said length by the depth of the ship or vessel at the midship division as aforesaid, and the product by the inside breadth at the same division, at two-fifths of the depth from the deck, taken as aforesaid, and divide the last product by 92.4, and the quotient shall be deemed the tonnage due to the cubical contents of the engine-room."

This "New Law," so-called, after some experience of its operations, though evidently having a tendency, and found, in fact, to be instrumental in correcting some of the worst features of its predecessor, was, however, discovered to be, in its general application, without any certainty in the justice or correctness of its results; and being, also, found to be greatly open to evasion, from the paucity and nature of several of its measurements, soon became as obnoxious to complaints as the "Old Law," which it had so recently superseded; and which, notwithstanding its abrogation, was now continually resorted to in commercial arrangements, and, occasionally, even by government itself in its contracts.

After repeated representations of this anomalous state of affairs, and the inconveniences and dissatisfaction which such a state engendered, the government, at the request of the ship owners, instituted the third commission of inquiry, in 1849.

The report of this commission, printed Feb. 1850, "confirmed

the complaints urged against the present system," and adopted the principle, "That the equitable basis on which charges for dock, light,* harbor, and other dues should be made, is that of the entire cubic contents of all vessels measured externally;" and "That, inasmuch as the poops, forecastle, and other covered-in spaces are directly or indirectly a source of earnings from cargo or passengers, those spaces should be all measured." And, in accordance with these views, they recommended a highly scientific system of *external* mensuration, originated by Mr. Parsons, a member of the commission. The system recommended comprised two rules; the first, which was applicable to the measurement of vessels on the stocks or in dock, and took cognizance of the correct *external* bulk of the vessel quite up "to the medium height of the upper side of the weather deck, by means of a curve of areas, constructed from five or more transverse sections, as may be required." "The correct men suration in cubic feet thus attained," was to be divided by **35**, and the quotient to be multiplied by .27 (twenty-seven hundredths) "for the register tonnage." The tonnage of the poop and forecastle, or any covered-in space, to be added. The second rule proposed was intended only for the approximate admeasurement of loaded vessels by a method of girting, requiring neither docking nor grounding.

Though amongst the members of this commission there were to be found some of the most important ship owners and ship builders of Great Britain, with many other eminent persons connected with the highest maritime associations and authorities, and presided over by one of the Lords Commissioners of the Admiralty, yet the plan recommended by them was unfavorably received by the great body of the shipping community.

Their plan was not adopted by government; yet the labors of the commissioners proved highly valuable in elevating the public conceptions of the nice degree of scientific accuracy required in the mensuration of shipping, whether it should be *external* or *internal*, that might be ultimately adopted, as the only security against the ingenious evasions of skillful constructors.

The rejection of the above plan adopted by this last commission having brought the question into a state of abeyance, the writer (himself a member and Honorary Secretary of the commission) was induced to engage in a further disquisition of the subject; more particularly in reference to the principle of external measurement, and the employment of professional drawing; those points of the rejected system in which, it was alleged, lay the *gravamen* of its ineligibility.

* We have no charges of lights in the United States.

And having assumed (as affirmed to be the case by the generality of ship owners in their repudiation of *external* measurement and adoption of internal cubature), that the profits of a vessel are, for the most part, directly dependent on the quantity of space* for the stowage of cargo, and accommodation of passengers—having assumed this as an incontrovertible condition of the question, all farther investigation of the subject has gone to prove the superior eligibility and desirableness of internal measurement. Upon this basis, therefore, a system of correct mensuration has been constructed, with a view of entirely removing the objections to which external measurement and the agency of professional drawing in the practical operation have been considered so seriously obnoxious.

This system of admeasurement has been approved by the commercial community, and enacted into a law by Parliament, and goes into operation May the first, 1855—the writer being charged by the government with the supervision of its introduction.

Rule No. 1, of this system, for the admeasurement of vessels when the hold is clear, consists of a series of internal measurements, which, at the time of taking them, are simply arranged in a prepared formula, from which the true cubical contents, and thence the tonnage, are directly computed by an easy arithmetical process.

And the approximate rule, No. 2, for the admeasurement of vessels having cargoes on board ; though the measurements are necessarily taken externally, which is effected partly by girting, is brought to express an approximate internal tonnage by means of a correcting factor.

These rules will be given in *extenso*, with their analysis, in future papers.

It will now be seen that Great Britain has established the third law for the *general* admeasurement of the merchant shipping, viz.: the "Old Law," or "Builder's Measurement," of 1773 ; the "New Measurement" of 1836 ; and the present law of 1855.

* If "*space*" is the basis of "profits" "for the most part," is it not quite as proper, also, to assume that *displacement* is the basis of profits for the *least* part ? Then why not adopt both ?—[Eds. Naut. Mag.

WAGES OF SEAMEN.

In the Senate of the United States, Monday, February 12, 1855, Mr. Sumner, of Massachusetts, in pursuance of previous notice, asked and obtained leave to introduce a bill to secure wages to seamen in case of wreck; which was read twice by its title.

Mr. Sumner said—In introducing this bill I desire to make a brief explanation, which shall, at least, be a record of my views with regard to it.

The bill proposes an amelioration of the existing maritime law in respect to the wages of merchant seamen, which, so far as England is concerned, has already been made by act of Parliament, and which, in our country, can only be accomplished by act of Congress.

By the existing maritime law, the seaman's wages depend upon a technical rule, which sometimes occasion hardship. Freight is compendiously said to be the mother of wages. In conformity with this fanciful idea, the wages are made to depend upon the earning of freight, unless the freight has been waived by agreement of the owner, or unless the voyage or freight be lost by the negligence, fraud, or misconduct of the owner or master, or be voluntarily abandoned. In case of wreck, the sailor has simply the chance of something, under the name of salvage, if the fragments of the ship saved happen to be of any value. But if the loss be total, then the sailor is without remedy. In the wrecks which occur with melancholy frequency on our churlish winter coast, this hardship adds even to the sorrows of disaster. Thus, as in a case which has actually arisen, a crew may commence service at Calcutta, may navigate the Indian Ocean, double the Cape of Good Hope, and bring their ship safely to the sight of land, and then, by the total loss of the ship and cargo, from the acknowledged perils of the sea, they may lose everything, and even their right to wages; and they may find themselves in a strange port, the prey of poverty. Nor can any merit, either throughout the protracted voyage, or in the hour of peril and shipwreck, prevent the operation of this technical rule.

There is also another circumstance which constrains the poor sailor. The owner may insure his ship, and also his freight, so that he may lose nothing but the premium he pays; but the sailor is not allowed to protect himself by insurance from the loss of his wages. His loss is, therefore, literally total.

Now, this technical rule, which fastens the wages of the sailor to the fortunes of the vessel, or, in other words, makes the right dependent on the successful issue of the enterprise for which he is hired, must be considered an offshoot of the mediæval maritime law. It is not to be found in the Roman law, nor in the maritime legislation of the Eastern Empire, nor in that early compilation which goes under the name of the Rhodian law. An eminent American judge, who has shed great light upon maritime jurisprudence—I refer you to the learned and able Judge Ware, of the District Court of Maine—has said, in a judicial opinion, (see *The Dawn*, Davies's Reports, 133,) that it owes its origin to the necessities and peculiar hazards which maritime commerce was compelled to encounter in the middle ages, when to the dangers of the winds and waves were added the more formidable perils of piracy and robbery. The rule having been thus established, has been preserved in the maritime jurisprudence of Europe, when the special exigencies in which it had its birth have ceased to exist.

It has outlived the circumstances and excuses of its origin; and now survives to vex, oppress, and disappoint the most needy, if not the most meritorious, of all who are concerned in the business of the seas.

This hard rule survives with us, but not everywhere. The greatest commercial nation in the world has led the way in its abolition, and set an example to the United States. The act of Parliament of 7th and 8th Victoria, chap. 112, sec. 17, (at the close)—called the "merchant seamen's act"—provides that,

"In all cases of wreck or loss of the ship, every surviving seaman shall be entitled to his wages up to the period of the wreck or loss of the ship, whether such ship *shall or shall not have earned freight;* provided the seamen shall produce a certificate from the master, or chief surviving officer of the ship, to the effect that he had exerted himself to the utmost to save the ship, cargo and stores."

But the sailor was not completely protected by this provision. Experience in England showed that the cunning of agents was able to introduce into the shipping article an agreement waiving the right to wages in case of loss, which the unthrifty sailor signed, ignorant or careless of its import. To remedy this abuse, a further act of Parliament, of 13 and 14th Victoria, chap. 98, sec. 53—known as the "mercantile marine act"—provides that,

"No seaman shall, by reason of any agreement, forfeit his lien upon the ship, or be deprived of any remedy for the recovery of his wages, to which he would otherwise have been entitled; and any stipulation which is inconsistent with any provision of this act, or of any other act relating to the merchant service, and every stipulation by which any seaman consents *to abandon his right to wages in case of the loss of the ship*, or to abandon any rights which he may have or obtain in the nature of salvage, *shall be wholly inoperative.*"

The bill which I now introduce is grounded on the provisions quoted from the two acts of the British Parliament, and contains two principles: First, That seamen shall be paid their wages down to the time of the loss of the ship, in case they serve faithfully to the last; and Secondly, That they shall not be permitted to lose their wages through any agreement in the shipping articles."

In some details I have departed from the British act. It has not seemed to me advisable to make the wages dependent on "the certificate from the master or chief surviving officer of the ship," but to leave the question open to proof according to the received rules of evidence. I have, therefore, said that the wages shall be paid, "*provided* the seamen shall have exerted himself to the utmost to save the ship, cargo and stores." The reasons of this course are clear. Masters are often part owners of American ships, and thus have a personal interest adverse to the sailor. In a mood of selfishness or recklessness, they might refuse the certificate, even though well earned. Now, in constructing a protection to the sailor, it does not seem prudent to make his wages dependent upon any such quarter. Indeed, it is hardly just to take from him the right to establish his claim before the Admiralty court, merely because an interested master refuses a certificate, when, perhaps, plenary proof might be furnished *aliunde*. Moreover, if the question were put in the control of the master, he might thereby obtain an improper influence over the minds of the crew, inducing them even to sacrifice truth in the event of any litigation between the owners and the underwriters.

There can be no harm in leaving the question of fact to be proved by competent witnesses, like every other question of fact; and the seamen

should be competent witnesses for each other. A sagacious court will know how to weigh their testimony, should it come in conflict with that of the officer. It seems proper, that the master, too. though a party to the suit,—as in the case of a libel against him *in personam*, or in a suit at common law,—should be competent to testify to the conduct of the libellant or plaintiff; in other words, whether he had "exerted himself to the utmost," and I have introduced into the bill a provision accordingly.

The British act of 7th and 8th Victoria contains another defect. It limits the wages to "every surviving seaman." I can see no good reason why the wife and children of the sailor who has perished in the forlorn hope, perhaps, in the cause of all, should be deprived of the humble wages so dearly earned by their natural protectors, and thus be compelled to feel a new deprivation added to their bereavement. In the proposed bill there is no such limitation.

Beyond this brief statement I need not, on this occasion, add another word. Already Congress has shown a disposition to modify the rigorous maritime law in some of its provisions. In 1851 it made a change in the liability of ship owners as common carriers. But this very liability originated to a certain extent in the same principles from which is derived the liability of the seamen, if they fail to bring the ship and cargo to land. Ship owners and seamen were both treated as insurers. This was in the age of force before the contract of insurance had spread its broad protection over commerce in every sea. The seaman should share this protection. He should be treated as not necessarily either a pirate or a coward.

In the discussions of the Senate on the proposed change in the liability of ship owners, it was effectively urged by my immediate predecessor, a distinguished Senator from Massachusetts, the late Robert Rantoul, Jr., that, if the United States failed to adopt that measure, the other maritime nations would have an advantage in the carrying trade. It is equally true that, unless we adopt the measures now proposed, Great Britain will have the advantage of us in the rate of seamen's wages; for, under her existing laws, the sailor can afford to work cheaper on board a British ship than under the American flag.

The measure now proposed is of direct importance to the two hundred thousand sailors constituting the mercantile marine of the United States. It also concerns the three millions of men constituting the mercantile marine of the civilized world, any of whom, in the vicissitudes of the sea, may find themselves in American bottoms. I commend it as a measure of enlightened philanthropy, as well as of simple justice.

I move that the bill—having been read twice—be referred to the Committee on Commerce.

The motion was agreed to.

For the Nautical Magazine.

PRICES OF NEW SHIPS IN BOSTON.

Boston, *May 17th*, 1855.

Messrs. Editors :—I write you a few lines, that you may know about the value of new Ships in this market; and how can I give you that which is more reliable than public auction sales? This I prefer in all cases where such information can be had. To-day was sold at Lewis's Wharf, in Bos-

ton, by that prince of auctioneers, John Tyler, the ship 'Dictator,' 1293 tons register, with the following dimensions:—Length, 189 feet; breadth, 38 feet 6 inches; depth, 23 feet 8 inches; oak frame and other materials corresponding in quality; workmanship good, both as to thoroughness and style; full inventory, and ready for sea—to Messrs. Whitten, Train & Co., $40 per ton, one-third cash, balance time.

Also, barque 'Telegraph,' by same auctioneer, time and place; 503 tons register, copper fastened and thoroughly salted, built in the best manner, and ready for sea, to Messrs. J. H. Shattuck & Co., $30 per ton, one-third cash, balance time.

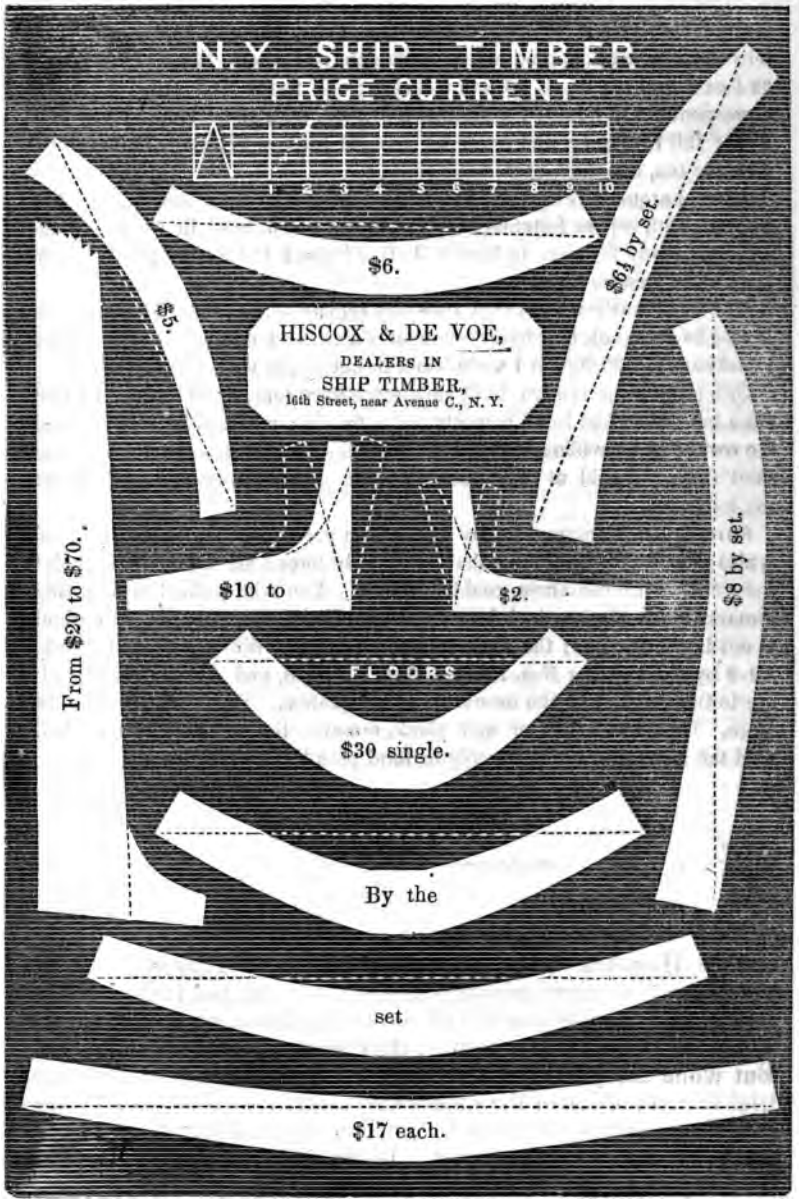
One other eastern built ship, 1008 tons register—the 'Palm Flush'—there is said to be much in a name—now at Calais, and offered for sale for the round sum of $35,000, as I understand it, but as yet without purchasers.

One other large eastern built ship, some 2300 tons, in all respects a first class built ship, and in all respects ready for sea; which ship, I understand the owner to be willing, and indeed concedes that he must have forty thousand dollars if sold at this time. I could go on, but enough to show the market.

Ship Stock Market.—In my last note to you upon Ship Stock, I omitted white pine deck plank. At that time only forced sales, and these under unfavorable circumstances, could be made. You will make the following remarks about Hackmatack knees:—Dull of sale, and prices only nominal at our last quotations; the stock on hand is large. White pine deck plank, 3 1-2 by 6 inches, for Nos. 1 and 2, from $25, $28, and $30 per M, according to the quantity of the former or latter quality. The stock on hand is large. Oak knees, timber and plank, remains the same as last quoted. And the same remarks will apply to hard pine timber and plank.

Joel Knight.

The Hot-Air Ship *alias* the Steamer Ericsson.—This vessel made a second trial-trip, under steam, on the 12th of May; and, if the speeches made, and the toasts drank on the occasion, were an index of the results, they must have been favorable. But while the press are recording the facts connected with the trial-trip, a portion of the dailies also assert it as a fact, that Captain Ericsson claims to have made a very important improvement by his new condenser. Being quite willing to let the dead repose in peace, we have nothing to say upon this subject, and shall wait for more light in reference to this improvement, before we announce it as such.



A set of floors and futtocks, $9 each. Flitch timber, 30 cents per cubic foot; oak plank, $35 to $40 per M.; deck plank, $30 per M.; hackmatack timber, 25 cents per cubic foot; chestnut, ditto; cedar, 60 to 75 cents; yellow pine timber, rough, $25 to $35; ditto, sawed, $30; yellow pine plank, $26 to $30 per M.

KNEES.—Oak, 5 inch, $3 each; hackmatack, $1.50; oak knees, 6 inches, $5; hackmatack, $3; oak ... 7 inches, $7; hackmatack, $4.75; oak knees, 8 inches, $10; hackmatack, $6; oak knees, 9 inches, ...ckmatack, $7; oak knées, 10 inches, $15; hackmatack, $10; oak knees, 10 to 12 inches, $15 to $20; ...ck, *$11 to $12*. Locust remains as quoted in November last.

metal, 25 cents, at 6 months; copper sheet, 28½ cents, ditto; copper bolts, 31 cents, ditto; comp... *s, 19 cents*, ditto.

LIST OF NEW VESSELS

REGISTERED AT THE PORT OF SAINT JOHN, NEW-BRUNSWICK, 1854.

Name.	Tons.	Where Built.	By Whom.
Queen of the Seas	1337	St. John	James Smith & Son.
Morning Star	1327	Do	F. & J. Ruddock.
Derigo	1282	Moncton	G. & J. Salter.
Class Merden	1768	St. John	T. Hilyard.
Hotspur	1670	Clare, N. S.	F. Bourneuf.
Bride of the Sea	1344	St. John	A. Sime.
William Jackson	986	Do	J. Sulis.
Mosquito	353	Do	T. McLeod.
David G. Fleming	1425	Do	W. & R. Wright.
Simonds	1202	Ten Mile Creek	Lovett & Parker.
Queen of the East	1293	St. John	Wm. Olive.
Herald of the Morning	1354	Do	King & Storms.
Palmyra	706	Do	William & J. Olive.
Hastings	1080	Hampton	B. Appleby.
James Fernie	1037	St. John	J. Fisher.
Pampero	1189	Do	John Thompson.
Manuel Montt	560	Do	M'Lauchlan&Stackhouse
John Bannerman	1131	Do	Thompson & Stackhouse.
Euroclydon	1325	Do	F. Smith.
Shalimar	1402	Do	J. Nevins.
Matias Cousino	617	Do	Jas. Smith & Son.
Gipsey Bride	1457	Do	W. Potts & Son.
Elizabeth	430	Do	Hy. Rowan.
James Hay	169	Digby, N. S	C. H. Dakin & Bro.
Earl of Sefton	1081	St. John	J. McDonald & Co.
Jacob Bradshaw	813	Quaco	J. Bradshaw.
Crown	47	Springfield	Youdell & Brown.
Louise Jewett	310	St. John	W.Ring.
Thos. Ritchie	281	St. Mary's Bay, N.S.	C. Sprecht.
Western Bride	1121	Kingston	W. P. Flewelling.
Madras	1255	Do	Wetmore & Frazer.
Bloomer	116	Dorchester	George Palmer.
Julia	104	Clements, N. S.	Wm. Kiffin.
British Maid	172	Sackville	C. Boultenhouse.
Shemogue	1110	Shemogue	—W. Boultenhouse.
Sea Witch	512	St. John	Thompson & Stackhouse
Marco Polo	62	Grand Lake	C. Egars.
Bride	63	Do	J. N. Tower.
Margaret A.	88	Harvey	J. Foster.
British Empire	1347	Sackville	C. Dickson.
Fury	389	Bathurst	James Willis.
Varna	166	St. Martins	W. H. Bradshaw.
Guiding Star	59	Salmon River	Lunt & Pickup.
Commander	14	Grand Lake	D. Munroe.
Ralph Waller	1087	St. John	A. Anderson.
Georgia	329	Do	J. White.
Jessie Boyle	815	Do	S. Rowan.
Lily Dale	606	Bathurst	Adam Boyd.
Veloz	571	Moncton	G. & J. Salter.
Mary	135	Tadnish, N. B.	T. O. Mahoney.
Margaret	177	St. John	G. Lane.
Egyptian	608	St. Mary's Bay, NB.	J. Lovett.
Lawrence Frost	1523	St. John	M'Lauchlan&Stackhouse
Condor	61	St. Luke	A. McIntyre.

Name.	Tons.	Where Built.	By Whom.
Ashby	181	Granville	A. Eaton.
Owangondy	1312	St. John	T. McLeod.
Yrca	1374	Do	James Thompson.
Sarah M	1010	Do	A. Sime.
Crimea	60	Digby, N. S.	S. Mallett.
Revenue	63	Grand Lake	G. Spenser.
Sea	854	Sackville	C. Boultenhouse.
Albert	169	Hillsborough	James Duffy.
British Trident	1400	St. John	F. & J. Ruddock & Bros.
Mary Ann	262	Do	J. Fisher.
Sunny South	1197	Dorchester	D. Forbes.
Conductor	59	Wickham	J Vanwart.
Robt. Parker	1048	Granville	G. Bent.
Meroo	1016	Moncton	M. Cochrane.
Silistria	1218	St. John	S. J. & W. Olive.
Alice Walton	795	Digby, N. S.	C. Dakin & Bros.
Nugget	238	Moncton	George Wood.
Chieftain	227	Wilmot, N. S.	J. V. Troop.
Victress	362	Annapolis, N. S.	Do.
Indian Queen	231	Salisbury	Thomas McEwin.
Brobio	626	St. John	J. Smith & Son.
Magnolia	1192	Ten Mile Creek	Lovett & Parker.
Garland	612	St. John	M'Lauchlan&Stackhouse
Crimea	405	Truro, N. S.	James Crow.
William John	40	Westfield	J. Parker.
White Star	2340	St. John	W. & R. Wright.
Dorchester	1337	Dorchester	John Frederickson
Witch of the Wind	1313	St. John	J. Sulis & Sons.
Thalia	221	Hillsborough	E. Allison.
Culloden	1148	St. John	J. McDonald & Co.
Alma	278	Weymouth	S. Savary.
Turon	1330	Moncton	M. S. Harris.
John Linn	1473	St. John	King & Storms.
Reindeer	54	Newcastle	J. Ferguson.
Catharine Jane	70	Salmon River	Lunt & Pickup.
Simoda	642	St. John	Wm. Potts & Sons.
Eleanor	1063	Quaco	Wm. Vail.
Milicete	1147	Hopewell	N. Bennett.
Favorite	787	Do	Do.
Burita	627	St. John	J. Smith & Son.
Josephine	260	St. Martins	H. McCullough.
Floating Cloud	305	Sackville	C. Boultenhouse.
Themis	888	St. John	Wm. Olive.
War Spirit	1317	Moncton	G. & J. Salter.
John Owens	1236	Digby, N. S.	E. J. Budd.
Inglewood	485	Musquash	H. Garbut.
Alma	1340	Oromocto	J. W. Craig.
Rover	147	Grand Lake	Wm. Elkin.
Oliver	1226	Quaco	T. Carson.
Hannah Fownes	896	St. Martins	Wm. Fownes.
Florence	444	Bay de Verte	J. Halliday.

62 Ships,
17 Barques,
7 Brigs,
5 Brigantines, } ...79,791 tons.
14 Schooners,

105 Vessels.

LAUNCHES.

THE following is a list of the vessels launched at Port Jefferson and Setauket during the past year:

Schooners Thomas W. Olcott, 250 tons; Henry Janes, 300 tons; A. Hammond, 230 tons; M. H. Reed, 225 tons, built by J. M. & C. L. Bayles.

Schooners John L. Darling, 230 tons; Naiad Queen, 175 tons, built by John L. Darling.

Schooners Ralph Post, 450 tons; Sunny South, 250 tons, John Roe, 300 tons; bark Anna, 450 tons, built by Bedell & Darling.

Schooner Island Belle, 200 tons, built by Hawkins & Brown.

Schooner War Steed, 200 tons, built by John R. Mather.

Schooner L. N. Godfrey, 150 tons; sloop Copy, 100 tons, built by John E. Darling & Co.

Bark Charles W. Poultney, 450 tons, built by Nehemiah Hand.

Schooner Carlton Jayne, 250 tons, built by Henry Tyler.

Schooner Rescue, 250 tons, built by Wm. Baker.

Schooner New World, 300 tons, built by D. B. Bayles.

Schooners Orb, 260 tons; Sarah A. Falconer, 150 tons, built by M. Dickerson & Co.

Aggregate tonnage, 5,120.

At Frankfort, from the yard of Dunham, Cutter & Co., a ship of 665 tons burthen, called the "Speedwell," owned by the builders.

At Rockland, by Messrs. Achorn & Dyer, a freighting ship of 1286 tons, called the "Cavalier," owned by the builders and Wm. J. Atkins, and to be commanded by Capt. John W. Glover, of Camden.

At Waldoboro, by Messrs. Jas. D. Guthrie & Co., a ship of 1271 tons, called the "E. Wilder Farley," to be commanded by Capt. James Nickels, of Bristol, Me.

At Castine, the ship "Benj. Thaxter," of 965 tons, built for the cotton trade, and owned by John H. Jarvis and others.

At Damariscotta, Me., from the yard of James Woodward, Esq., a ship of 1000 tons burthen.

From the yard of Wm. Hitchcock & Co., a ship of 1100 tons burthen. Also, same day, the ship "E. Morris," 1200 tons, built by Metcalf & Norris.

At 16th street, East River, N. Y., schooner Nahum Stetson, —— tons, owned by Edgar Sprague and others, built by Thomas Eskin for the coasting trade.

At Rockport, Me., April 17th, brig Katahdin, 380 tons.

At Ellsworth, Me., a three-deck freighting ship, about 1800 tons, called the Horizon.

At East Boston, Schooner Halcyon, about 100 tons.

At Rockland, Me., April 20th, schooner Ella May, about 60 tons.

At Owl's Head, May 2d, ship Octavius, 808 tons.

At Marblehead, May 3d, brig exponent, 250 tons, fully rigged.

At Brantford, Conn., schooner R. M. Shepard, 100 tons.

At Pittston, Me., May 3d, ship Lion, 830 tons.

At Pittston, Me., May 5th, brig A. C. Merryman.

At Damariscotta, May 5th, ship about 1800 tons, not named.

At Newcastle, Me., May 5th, a three-deck ship, 1900 tons.

At Belleville, N. J., schooner Lovet Peacock, about 400 tons.

At Fairhaven, May 1st, schooner Cremona, 168 tons.

At Rockland, April 30th, bark L. D. Carver, 412 tons.

At Biddeford, from the yard of Oakes & Ricker, schooner Ruth Ann, about 200 tons, owned by builders and others.

At Lincoln, Me., May 5th, from the yard of A. S. Austin, a three-deck ship about 1900 tons.

At the Westervelt ship yard, N. Y., May 23d, a schooner-rigged lighter, for the timber trade.

At the yard of Thomas Eskin, the old schooner Alexander M., which has been re-fitted.

VESSELS SOLD.

SCHR. Florence has been purchased at Norwich, Conn., for $2,000.

Ship Miles Standish, 1,000 tons, built at Richmond, Me., has been purchased at Boston, for $49,500.

Ship Ariel, of Boston, 799 tons, has been sold for $30,000.

Schrs. Tioga, 215 tons, $2,300, cash; A. Totten, 54 tons, 16 years old, for $575, cash; and Angeline, 56 tons, built at Barnstable, for $450, cash, were sold at auction in Boston.

Schr. Louisa Dyer, 3 years old, 146 tons, has been sold for $5,000.

Schr. Alfred, 184 tons burthen, was sold at auction at New-Bedford, without appurtenances, for $1,482 50.

Barque Silver Cloud, 452 tons, built at Georgetown, Me., in 1853, was sold by auction in Boston, for $17,300.

Ship Frances Henrietta, 407 tons, was sold by auction in New-Bedford, for $4,050.

Brig Mermaid, 290 tons, was sold by auction at Norfolk, for $2,300.

Schr. Yarmouth, now plying between Yarmouth and Boston, has been sold for $2,800.

Barque Roman, 245 tons, built at Medford, Mass., double-deck, with partner beams, and metalled in 1853, has been sold for $2,525.

A ship of 1050 tons, built the past winter by Messrs. Trufant, Drummond & Co., Bath, and to be launched immediately, has been purchased by Messrs. J. Hooper & Co., Baltimore. Her name is the William Penn.

Ship Venice, of Philadelphia, 600 tons, sixteen years old, was sold by auction at Philadelphia, for $10,550.

Brig Lucy H. Chase, built at Robbinston, Me., 190 tons, three years old, was sold by auction at Boston for $4,300, one-third cash, balance 4 and 6 months.

Schr. Alfaretta, built at Harrington, Me., 162 tons, six years old, was sold for $2,700, cash.

Schr. W. B. Darling, of Providence, 114 tons, 3 1-2 years old, has been sold for $7,500.

Steamer Tennessee, built in 1854, for the Charleston trade, 1140 tons capacity, was sold by auction at Baltimore, for $59,000. This steamer had been in service about twelve months, is in the best order, and cost $130,000.

Barque America, 257 tons, has been purchased at Mattapoisett for $4,000. She will be continued in the whaling business.

Brig New Era, 8 months old, was sold at Providence, for $10,500, cash.

THE

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AND

QUARTERLY REVIEW.

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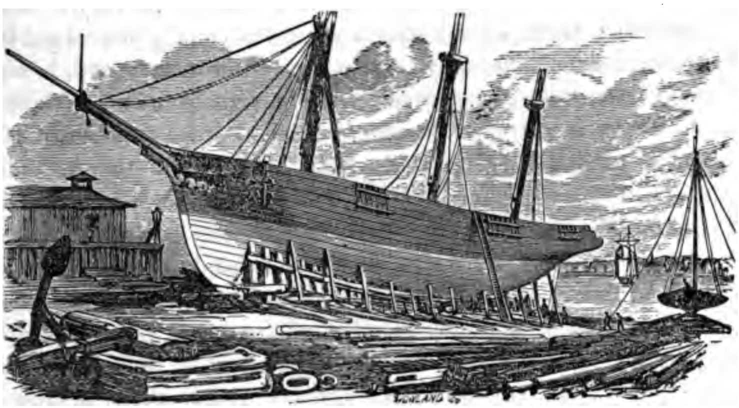
Mechanical Department.



THE GREAT PROBLEM OF SHAPE FOR VESSELS—WHO SHALL SOLVE IT?

THIS question has perplexed not only the mathematicians, but the practical men of almost every age, and in almost every quarter of the commercial world, and remains a problem still, beyond the reach of the theorizer and of the practical ship-builder. At various periods in the world's history, there have arisen those who have assumed that all which was worth knowing in the science of giving correct shape to vessels, had been placed under contribution by the superiority of their genius, or

by the power of their penetrating minds, and still this mysterious form lies in the shades of futurity, faintly foreshadowed by the laws of nature, dimly illuminated by practical knowledge, and still more remotely approximated by the empirical systems of modern times. Numerous experiments have been made with blocks of every shape, size, and degree of density which human ingenuity could devise—these experiments in England alone, by one individual, Colonel Beaufoy, have served to fill a large quarto of over 500 pages, and the patient explorer left the subject mantled in greater obscurity than he found it, simply because his experiments were not based on the well-known lessons gained by practical knowledge. Works of the past, as well as those of the present century, teem with the mechanical modes of describing the best shape for determinate sections of vessels; and while one student exhibits his confidence in his new discovery by the temperature of his expressions, a second is equally successful in his disclosure of the only form nature ever recognized, being based on the laws of resistance, while a third exclaims, with exultant triumph, *Eureka! Eureka!* Thus the mechanical department of maritime pursuits has been jostled from time to time out of the more peaceful paths of hereditary knowledge, until every shipbuilder may be accredited as the projector of his own theory; and few, indeed, there are, who do not carry, concealed in the archives of the mind, some favorite empirical rule, to be interwoven with the practice of every day life. We are not among the number of those who believe that these thousand subdivisions will tend to hasten the time when the synthetical compendium of perfected science, in modelling vessels, shall enlighten the world; nor do we believe that such ambrosial fruit will ever grow within the poisonous influence of naval economy; nor yet can it hardly be expected that the man who has spent the flower of his life in nursing and warming into vigorous life the prejudices of his ancestors, shall be the successful discoverer. But it is reserved for the practical thinking man who never mounted the hobby of his antecedents, but who, with free and unfettered mind, seeks truth for the love of it. Without these qualifications, the Geometer may soar above the objects of sublunary care, and revel in the glories of attenuated space; he

may mensurate the area, and span the orbit of every star in the celestial sphere; he may descend with the Geologist into the caverns of his mother earth, to feed his fancy on her hidden laws, and investigate the denser or the milder mysteries of created matter, in the solid or in the vaporous form, and still, in the noontide of his strength, be unable to determine the radius of that curvature which shall serve as the index to the maturity of science in Nautical Mechanism, or to mark the centre of gravity, and calculate the exponent of that line of resistance which defines the altitude of science in modelling vessels. Among the most prominent theories which have seemed to carry conviction to the mind of those who do not look beneath the surface of things, is that of the *wave line,* based on the assumption that lines of flotation and lines of resistance are synonymous terms; as a consequence, the formula by which the wave of translation is expressed, has been regarded as that which is exactly adapted to the immersed anterior of all vessels; while the form described by the oscillatory wave was best adapted to the posterior part, and these, it will be observed, are to be applied to the water-plane parallels, or at the successive lines of flotation, which being entirely foreign to lines of resistance—which cannot take parallel courses—can have no just demands to the confidence of the scientific world.

Another mode of philosophizing upon shape may be found in securing the form of a large number of favorite vessels, and by the construction of a scale of curved lines, in which may be found the reputed form. This scale may number from 1 to 100, and the decimal of each line, and its centre of gravity, be readily known by the number it bears; and having proper tables or combinations of units, suitable numbers may be selected for the form of a vessel of any given capacity. And, inasmuch as the lines of vessels follow no law within the pale of geometrical curves, there is no difficulty in securing a mode of modelling, which will readily furnish both the shape and exponent of capacity; and if we are content that no improvement can be made in the shape of vessels, this mode would perhaps be the best that could be devised, after we have first settled upon the curvature in the scale, for we may have a change in the form of the locality of

the transverse section, while the capacity will remain unchanged; or we may have the same transverse section with a change in the exponent of capacity, just like ringing the changes of a certain number of bells, but they are the same bells still, both in number and sound; hence, we say, that although the mode of modelling may be, and indeed is, convenient for the builder, it is the knell of death to progressive science in ship-building, and is adapted only to those who follow in the *wake* of improvements, but never introduce any.

The principle upon which this mode is based, was first introduced by Chapman, the Swedish Naval Architect. By this mode of determining the form of a vessel, the greatest transverse section acts the most conspicuous part, both in its form and locality; hence the reason why neither great speed or carrying qualities may be expected from this scale or list of changes. The difference in the capacity of the extremes will not greatly exceed 10 per cent. If we look at the performances and carrying capacity, in connection with the draught of water, we shall discover that improvements have been at a stand still wherever and whenever this method has been adopted. By this mode of operation the good qualities must first be secured by the introduction of new models, and then they are systematized into scales for the advantage of those who furnish the design. The ablest Marine Architect of the age would not build a second ship, by the same model, if the cost of altering were not a consideration. What egregious folly, then, to hoard up the old models which have been repudiated, because improved upon, and thus shackle our creative powers by confining them within a scale of worn-out shapes, no matter how many it contains, whether 100 or 1,000. Although it has been our province to make not a few designs and models for vessels, we have never been content with furnishing a second party with an old model, and even when the model or draft of a particular vessel was sought without alteration, we have invariably made such amendments as experience would suggest, and more than once we have been amused to learn that the new vessel performed even better than the original, in consequence (as was supposed) of the superior management of her *protegé.* We are glad to know, that although

a large number of ship-owners, and builders, too, have assumed, by the adoption of this course, that improvements in modelling vessels were at an end, the largest number of ship-builders have never yet given their sanction to this *fogyistic* mode of building after old models. It is for the sole purpose of throwing down these bars of prejudice, and of opening the windows of mechanical intelligence, which leads directly to the channels of science and currents of thought, that we give to the world the lines and tables of vessels, that all may have the *means* of improvement; and we mean by this to say, that no man can successfully improve upon what has been done, without being put in possession of the latest efforts at improving shape; hence the folly of adhering to a stereotyped scale of models, no matter what era they may embrace. Our efforts at improvements have scarcely begun. Look at the heterogeneous law under which we have been working for the measurement of vessels, and the thinking man cannot but admit that ship-building is but in an infantile state. We have had the general principles of these empirical rules in our mind for years, but have never published them, because we believed that it would not be advantageous to the cause of science to exhibit them to the world. We had occasion to remark in the *Ship-Builders' Manual* and we deem the sentiment equally appropriate in this connection, "the mechanical and commercial mind is like a serial publication intended for a quarto volume—the world is seeking with intense interest to read the preface." The construction and outfit of shipping, with its influence, is the world's ledger.

THE BARQUE RICOT.

The lines of this vessel, built at Green Point, L. I., and among the finest of her class, have, by the honest frankness of her builder, E. T. Williams, Esq., been furnished for the edification of the readers of the *Nautical Magazine*, with that generosity which ever accompanies true genius wherever found, and with a proud consciousness that nothing has been done in the nautical department of the mechanical world, but which may be not only repeated, but

improved upon at a future day, however near it may approximate the recognized standard of utility at the time of construction. The Ricot, it may at once be seen, stands among the foremost vessels of her class, being selected as one of the vessels best adapted to the Kane Expedition, and would have been purchased for that philanthropic object at an advance of ten thousand dollars on her cost, but for the high estimate her owners placed upon her. In connection with her lines, we have also been furnished with the following particulars relative to her construction, and it will be seen that her proportions are such as command the confidence of those interested in her completion, with the exception of her spars, which Mr. Williams regards as unnecessarily heavy. With this exception, he may with confidence submit her to the element for which she was designed.

From the tables we have worked out the following data of dimensions and calculations :—

DIMENSIONS.

	Feet.
Length on 4th water-line for calculations........................	120.00
Height of 4th water-line above base...........................	8.00
Breadth of 4th " " on dead flat.........................	27.50

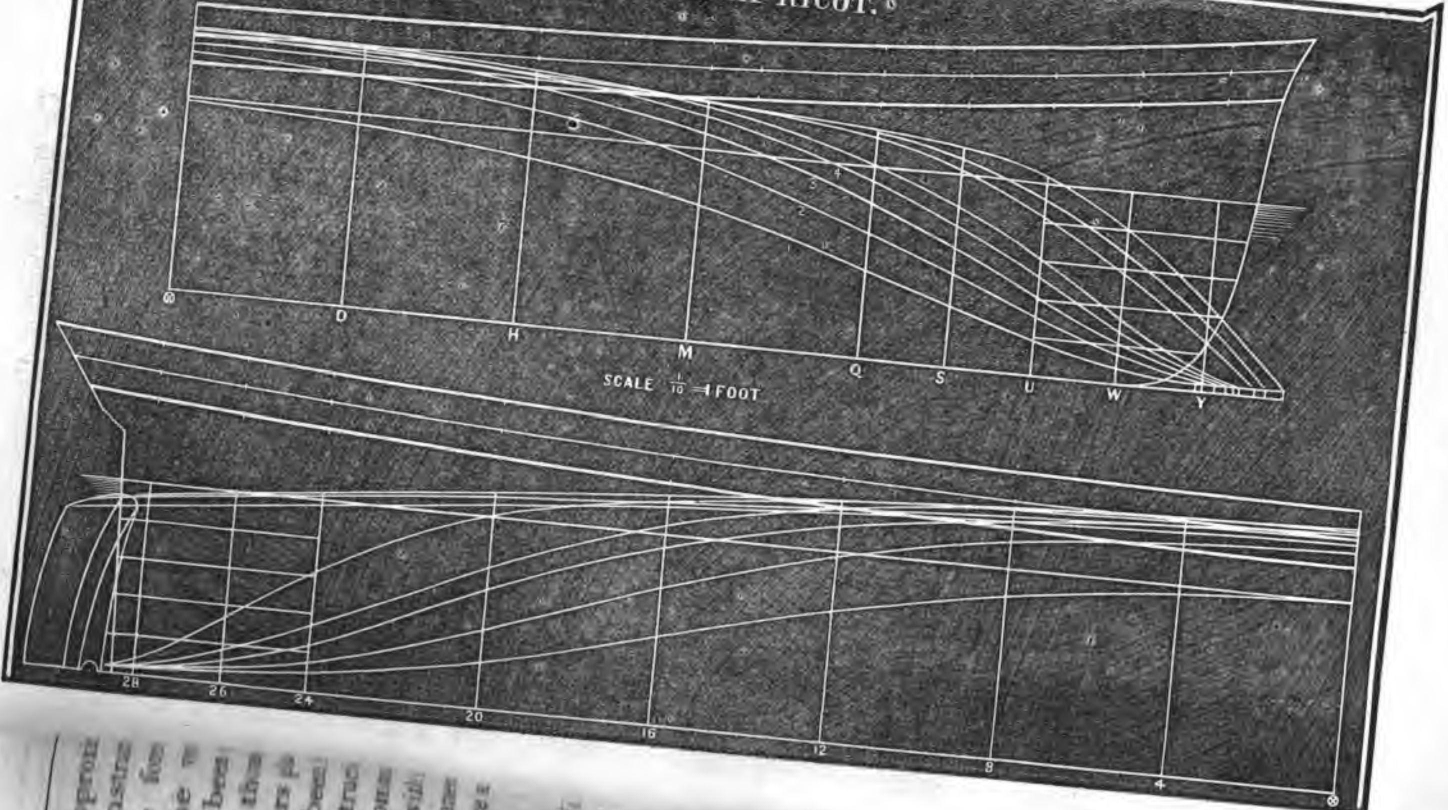
CALCULATIONS.

Area of 4th water-line in square feet..................	2302.82	
Exponent of the same...	0.69	
Centre of gravity forward of mid length......................		1.39
Location of dead flat forward of mid length on 4th water-line....		5.55
Moulded displacement in cubic feet..................	13295.80	
" " in gross tons....................	379.88	
Exponent of displacement at 4th water-line.............	0.50	
Centre of gravity of same below 4th water-line................		3.25
Centre of gravity of displacement forward of mid length........		2.17

SCANTLING OF HULL.

The keel is sided 12 inches, and extends below base 26 inches.
The stem is sided at rail 13 inches; at base 12 inches.
The stern-post sided at head 13½ inches; at base 10½ inches.
Floors moulded at seat 14 inches.
Frame at bilge 11½ inches; at rail 5½ inches.
Floors sided 12 inches midships, and diminished to 8½ inches

BARK RICOT.



Frame sided, 1st futtocks 9 inches; 2d, 9 inches; 3d, and tops 7½ to 8 inches.

Keelson 13 + 26; with 5 inches by 12 inches side keelsons.

Ceiling 3 inches on flat; bilge strake 7 inches, five in number. Clamps 6 inches, three strakes 13 inches wide, and tapered at ends to 3 inches.

Deck Frame.—Beam amidships 14 inches sided, and 10 inches moulded; beams at ends 12 inches, and moulded 10 inches.

Knees in deck frame sided 5½ inches, of hackmatack; hanging knees under every beam, also of hackmatack, sided 7 inches amidships, and 6 at ends.

Water-ways sided 12 inches, and moulded 14 inches.

Plankshear 4 inches thick.

Rail 5 inches thick, and 13 inches wide.

Wales 5 inches, 10 strakes in number, 6 of 3½; bottom 3 inches, oak garboard 5 inches by 15.

Deck Arrangement.—A forecastle to the foremast, flush with the top of rail. Midship house, 8 + 16 feet, 6½ feet high. Half poop above deck flush with rail, extending quite forward of mainmast, with a trunk raised in after part for cabin, 16 + 28 feet, with a cock-pit aft.

LIST OF SPARS OF BARQUE RICOT.

	Feet long.	Feet.	Diam.	Diam.
Foremast	58	head 10	partners 22 inches	neck 14 inches
Mainmast	62	" 10	" 22 "	" 14 inches
Mizzenmast	56	" 8	" 16½ "	
Fore and maintop-mast	18		cap 8	
Fore and maintop-gallant	21			
Fore and main-pole	9			
Fore and main-yards	58	arms 3½	slings 13½	
Fore and main-topsail	45	" 3½	" 11	
Foretop-gallant	34	" 2½	" 7½	
Fore royal	24	" 1½	" 5	
Bow-sprit outboard	23		25 + 25 inches	
Jibboom outside cap	15, flying-jibbom 11, pole 6 feet,		12 inches	
Spankerboom	32, pole	3½ feet	8 inches	
Spanker-gaff	22, "	6 feet	5½ inches	
Martingale	9, "		5½ inches	

Stations of Masts—Foremast 23½ feet from knight-heads. From centre of foremast to centre of mainmast 42 feet; from thence to centre of mizen 28¼ feet.

Rake of foremast	1¼ inches per foot.		
Rake of mainmast	1½	"	"
Rake of mizzenmast	1¾	"	"
Rake of bow-sprit	4	"	"
Height of main rail from deck	4¼ feet.		

SHEERING—ITS USE AND ADVANTAGES, AND THE PRINCIPLES UPON WHICH IT IS BASED.

In the catalogue of philosophical principles developed by *nautical mechanism*, none more fully sets forth the principles of geometrical science than that of sheering vessels. How rarely the symmetry and graceful proportions of a vessel are developed under a harmonizing sheer, the *connoisseur* in nautical science alone can tell. Whatever may have been the manner in which the curvature of a vessel's sheer has been determined, whether by mechanical or geometrical rules, it is by no means an extravagant assertion to say, that the exponent of beauty of every vessel above water lies within the line of curvature of the sheer; and as the sculptured marble of the human form lies within the quarry, so the adapted curvature of sheer lies within the model, and no man, whatever amount of experience he may have acquired in ship-building, can develop the beauties of his model without a consultation of the principles upon which sheering is based. The object of giving sheer to vessels originally was designed to afford security against the crest of the wave, when at sea, and, at the same time, to furnish increased facilities for boarding the enemy, and the ancient galleys were furnished with an iron beak for the specific purpose of destroying their enemy's vessels. Builders of modern times have continued the practice of sheering vessels, but for a widely different purpose. Since the introduction of science into the art of constructing vessels, sheering has been recognized as useful as an auxiliary in furnishing strength—the sheer of a vessel being an inverted arch, is calculated to sustain the extremities. The height of the bow can have but little influence on the wave, aside from the model of the vessel. By one form of vessel the bow may always mount above the influence of the crest of the wave, and the rail be but 10 feet above the bottom of the keel, while in another of different model, 30 feet above would prove insufficient to clear the foaming crest; hence we discover that the depth of vessels furnish no security against the encroachments of the element we navigate. When we view security in its proper light, we discover that its principal object is

symmetry and utility, strength being of necessity, in this case, a minor consideration, inasmuch as the increased depth required at the extremities to furnish strength from the sheer, taxes the strength of the entire vessel—100 pounds at the extremity of a vessel taxes her longitudinal strength more than a ton would at the centre of gravity—hence the necessity of avoiding any increase of weight beyond the most stringent necessity at the ends of vessels. As it regards strength in the sheer, it is only found in conforming to the mould of the bow; we mean by this to take the snei out of the planking below the gunwale or plankshear of the vessel, hence we may discover that the sheer and side lines should harmonize, and vessels should commence, at least at the gunwale, without snei to their plank, both on their bow and stern. It requires but a moment's reflection to discover that such form of sheer is intimately connected with the modelling of the vessel; but its advantages are still more apparent when we consider the economy in the materials, in connection with the strength furnished, when there is no snei required, and when we may possess all the strength the material contains, in its pristine state, and not as has been, and is now too often done, waste one-third of the intrinsic strength of the plank by cutting it across the grain, and another third thrown away in obtaining the snei we require, which is the builder's loss, and must of necessity add to the cost of the vessel. But fogyism, no doubt, will rise up in judgment against us, and we shall be told that vessels never having been built so, would appear unsightly; they would not be handsome, as the nautical world understands the term, and would, as a consequence, be rejected by those who rely on the appearance of things in forming an estimate of their value. But we regard *utility* as the only standard of value in maritime, as in other pursuits. If a ship is stronger with the same weight of material, more useful, because more efficient—more valuable, because more profitable—more secure, because better protected against the dangers of the sea, she is not only the best ship, other things being equal, but she is the cheapest ship, and, when well understood by underwriters, would insure at better rates. We are well satisfied that when sheering vessels is regarded as a matter of

study by the ship-builders of the United States, a great saving of materials will be effected, and better vessels will be furnished at the same cost; and when we remember that the outside sheer is not arbitrarily confined to the deck line, there is nothing to prevent the adoption of such form of sheer at the gunwale as would be furnished by the straight edge of a rule-staff when bent around the bow. It will be at once observed that the shape or flare of the bow determines the form of the sheer, and if the side line or half breadth line of the bow be a geometrical curve, the sheer cannot be other than fair and symmetrical. This mode of sheering would soon be adopted were we not more completely wedded to the opinions of others than to the laws of utility. By the adoption of this mode of sheering, vessels would be much better planked, sitting snug to the timbers, worked to better advantage, and furnish more support to the vessel, and the bulwarks would receive a large share of the tapered strakes which are now distributed over the entire vessel below the plankshear. We have been led to these remarks from having seen so many vessels recently with an incongruous sheer hanging on the bow, as though it were a burden—a part of the vessel's cargo, without a particle of life or animation, not at all adapted to the form of the vessel. We were taught to regard mouldings as ornaments, and we have yet to learn that we were wrongly instructed on this point; but we have often seen a beautiful model destroyed by a most heterogeneous sheer, and this is becoming quite common.

THE U. S. WAR STEAMER PRINCETON.

This vessel, of which so much has been said by the officers of the navy, whose opinions have been heralded the length and breadth of our widely-extended country, has arrived from Havana, which port she left on the 6th. She has returned home for the purpose of receiving a new propeller—made expressly for her in England under Griffiths's patent—which it is confidently expected will improve her speed. We would suggest, also, that she have new boilers and engine, and that the shaft bear-

ing on her stern post, weighing 4,000 pounds, which cost the Government 60 cents per pound, be taken off, and one of more moderate size be substituted, and at a more reasonable price, say 25 cents.—(See price current *N. M.*) This vessel has been slandered, and without just cause. Her officers have circulated various reports detrimental to her reputation; for example—she is said to be less capacious and less stable than the old Princeton; while she is longer, wider, and has more stability. The secret is, that she has been classed among vessels of larger size, and, as a consequence, a heavier armament, and a larger number of men were placed on board, than that for which she was pierced; and while she is overburdened in armament and men, she has been crippled in power. The history of the disposal of the boilers and engine of the old Princeton, as contrasted with that of the new, would be worthy of perusal by practical men. The story of the japanned lamp, which was left in the new boilers by the carelessness of the workmen, until necessary to clean them, when it was found that it had not been sufficiently steamed to remove the japan, is worthy of a place in the archives of the Navy Department. We hope she will not only be furnished with a new propeller, but new engine and boilers, in order that the model, or the vessel, may have a fair trial, when, we think, that it will be found that she is nothing behind the best war steamer in the navy now afloat—let her, at the same time, carry the armament for which she was built, with the number of men. It is only necessary to contract the accommodations of the officers, in order to blast the reputation of any vessel, we care not what her qualities may be—this is all done on the first cruise, long before the vessel has terminated her voyage, by writing letters home, which are published, and mould her reputation for efficiency or deformity, long before she has earned it.

THE SAULT ST. MARIE CANAL is completed, and vessels may now pass without obstruction from the waters of Lake Huron into those of Lake Superior. The Canal was begun in June, 1853, and has occupied two years in its construction. It is one and one-eighth miles long, 70 feet wide, and 12 feet deep

THE NEW WAR STEAMERS.

The Merrimack, just launched, at Boston; the Minnesota, at Washington; the Wabash, at Philadelphia; the Colorado, at Gosport, and the Niagara, at the Brooklyn Navy Yard, are far advanced toward completion; the four first named are built by the same model, and in the manner of construction are very similar. The nautical mechanic, who is the least observant of the form of vessels, cannot fail to discover that if the four steamers, building by the same model, are right, and that building under the direction of Mr. Steers is also right, no one can go wrong. From our own knowledge of models, we should be very much inclined to the belief, that those vessels modelled by the bureau, were old models, in the general principles, if not in the details. We are inclined to this belief, by the analogy they bear to some of the vessels in the English navy; and as the bureau have for a considerable time had a draughtsman in its employ, whose stock of English tracings was somewhat bulky, a part of whose employment was to furnish duplicates of those tracings, it would not in the least surprise us, if the discovery should yet be made, that the United States navy has been increased by the adoption of the models of four of the screw vessels of the British navy. If we believed there was anything really good and worthy of imitation in those models belonging to the navies of the Old World, we should be among the first not only to adopt them, but to give Her Majesty's government due credit for the same. It cannot, however, be denied, that the navies of the Old World are in a state of decrepitude, and that the maritime governments of Europe are endeavoring to acquire, through the channels of progressive commerce in the United States, that which they find themselves unable to supply at home. The principle upon which they operate in war vessels, is wrong in theory, and not the less so in practice. The British Admiralty have yet to learn, that if the screw power be only an auxiliary power, and the sails the principal means of propulsion, that the vessel should number among the fastest of vessels, when under sail alone, more particularly when the screw is lifted above the surface of the water. It is noto-

riously true, that a large proportion of the vessels of the English navy are old models, many of them more than 50 years old. It is also equally true, that our first war vessels were transcripts in form of the English, and within the last quarter of a century, those models have been repudiated in the United States, and the Board of Navy Commissioners who adopted them, have also been set aside, while the newer principles of construction, introduced by private builders, have been adopted with entire and complete success; but what is still more remarkable is this, many of the old hulks in the English navy, which could not be made available either in the public or private service, have been revamped by placing an engine on board, and a propeller at the stern, and now, forsooth, these are regarded, not only as an increase to the naval force, but as improvements introduced; and how many promotions have been made as a consequence of introducing the happy thought, we dare not even venture a *guess*. The question, then, which presents itself to our mind, is this, was it the design of Congress, when passing the act for the construction of six war steamers, that five of them were to be dull sailers, with a full measure of sail, and still more tardy under steam, having but an auxiliary amount of power? We think not, and are well convinced that the American people will not be satisfied that the new war steamers shall be classed in the same list of performers with the Susquehanna, whose recent performance gave such general satisfaction to a few, and such universal dissatisfaction to so many, in whiling away 19 days of good weather, from Valparaiso to Acapulco, in steaming a distance of about 3,000 miles, being a fraction over 6½ miles per hour, and that, too, with a full allowance of power. The account of this passage was published the length and breadth of the land, as being unprecedentedly short!

THE U. S. STEAM FRIGATE MERRIMACK.

This vessel, the first of the six, which, by the efforts of the Hon. J. C. Dobbin, Secretary of the Navy, were ordered by Congress to be constructed, was launched on the 14th day of

June, from the Charlestown Navy Yard, Mass. We publish what information we can gather respecting her, not being indebted, however, either to the Commodore of the yard, or the Constructor, for any of our items. These gentlemen, like a few others connected with the navy yards of this country, having expressed their minds against taking any interest in marine or naval improvements, as set forth in the pages of this magazine. The tide of progress has, within a few years, drifted many an "ancient mariner" into the eddies along shore, where the navigation is in safe proximity to land—plain circular sailing, over and over the same smooth course, and entirely free of the giddy dangers of the deep, strong current setting forward to the ocean of progressive perfection in maritime art. For some minds, the age is too fast. There are souls who fear to fly, being only adapted to guard the roost. The NAUTICAL MAGAZINE came unexpectedly to many, as every new thing comes, and found them not so much with their pockets empty as with undeveloped minds, not yet sufficiently strengthened to digest the idea of journalizing the progress of the noblest and most stupendous art under heaven, in an American style.

We forbear any further remarks, however, at this time.

As we have said before, the Secretary of the Navy holds Mr. John Lenthall, chief naval constructor, responsible for the model of the Merrimack, and Mr. Delano has been charged with her construction, in his capacity as naval constructor at Charlestown.

From the *Boston Post* we condense the following description:—

"The keelson is 18½ inches sides, 2 feet 6 inches deep, and 250 feet long, composed of live oak plank, coaged and bolted together. It has two sister keelsons, bolted through the bottom, and together, with 1½ inch bolts. The main keelson is bolted through each floor timber, with two copper 1½ inch bolts, clinched on the under side of the keel. The entire depth of the keel is 2 feet, with a 3 inch shoe beneath. The frame is of live oak, sided 14 and 13 inches—this is coaged together sideways, and dowelled endways. The keel, stem and stern post, are built inside of the ship 10 inches. The greatest siding size of the stern post is 29 inches in the wake of the shaft. The frame is filled in solid, and caulked 14 ft. out from the keelson. The dead-wood is coaged together throughout. The

after dead-wood is secured by copper bolts, the length of which are from 14 to 17 feet of 1½ and 1¼ inches diameter, driven with a pile hammer weighing 110 pounds. Forward, she has ten live oak breast-hooks, fastened through and through with copper, under the water, and iron above. Aft, she has seven breast-hooks, that side 14 inches. Garboard strakes, 10 inches thick, and bolted through and through from side to side, make the seats of floor 3 feet in length. The bottom plank is of white oak, 5 inches thick. The after cants are fitted closely together, as high as the berth deck, and bolted edgeways. The frame is cross-strapped by iron bands, 4½ inches by ¾ inch, running from stem to stern, and from the spar deck clamps down to the turn of the bilge. These are bolted into each timber and into each crossing with 1¼ inch bolts, riveted on the inside. The strapping aft runs down to the dead-wood. The depth of the hold from the berth-deck is 18 feet. The berth-deck stanchions, white oak, and side 10 inches. Her dead rise is 3 feet at half floor.

"The boiler and engine keelsons are of white oak, siding 18 inches. The power of her engine is not known; but it is supposed to be about 800 horse. The shaft to the propeller, which will be 111 feet 9 inches, is to be supported by four live oak bearings. Above the space allotted for the shaft is an immense live oak beam, 3 feet sided, 15 inches deep, supported by two 10-inch wrought iron columns, on which the mainmast is to be stepped. The decks over the boilers are made with reference to removal for repairs or alteration. The main pillar block, through which the shaft passes, is of live oak, 4 feet wide and 20 inches deep. The shaft hole is 18 inches in diameter and 20 feet in length. The propeller will be one of Griffith's English patent, and will have two blades of 17 feet diameter. The blades may be altered to suit any angle from 36 to 44 degrees. Two composition castings attaching the stern-post, abaft the propeller space, to the keel, weigh 2,500 lbs. The apparatus will be fitted in a manner to admit of its being hoisted to the spar deck, and lowered to its bearing without trouble, that she may use her steam or not at pleasure.

"The after orlop-deck contains the cockpit, two large bread rooms, two sail rooms, and store rooms. From the orlop-decks, the powder is passed to the gun-decks in time of action; the magazines being immediately below them. The mizzenmast steps upon the after orlop-deck. The forward orlop has a general store room, two sail rooms, and two bread rooms. The orlop-decks are kneed off with lodge-knees, siding 6 inches.

"On the berth-deck is the wardroom, the largest in any ship in the service. (This qualification is alone sufficient to make her the best vessel in the navy.) It is 45 feet long, and is provided with a pantry, divided from the main room by an openwork partition. It is provided with fourteen state-rooms for the commissioned officers. The chief engineer's room is connected with the ward-room by a door, as, holding a commission, he is entitled to mess with the other officers. His assistants have state-rooms adjoin-

ing his. The midshipmen's quarters are on the opposite side from the engineers. Upon this deck the men swing their hammocks. It is ventilated by air ports in the sides. Here are the purser's store-room, the dispensary, and seven store-rooms for various uses. 'Sick Bay,' the hospital of the ship, is also situated upon this deck.

"The berth-deck beams are of yellow pine, and side 16 inches. They are kneed with one dagger knee and one lodge, siding 8 inches, except in the wake of the mast, where two dagger and one lodge knee are used. This deck has three thick strakes, 8 inches wide, bolted through the side of the ship, driven from the outside, and clinched upon the inside. It has likewise seven strakes of clamps, 12 inches wide and 7 thick, keyed together with locust keys. This deck is 5 feet 9 inches clear under the beams.

"The gun-deck is pierced for 38 guns, and the most of her intended armament of 40 guns will be carried upon this deck. Height of port-sills =20 inches above deck. The commander's quarters upon this deck are very spacious, embracing 30 feet of the after portion of it. Upon this deck are the capstans and riding bitts, chain-stoppers, pumps, &c. The capstans were manufactured in the yard. There are four main pumps, and two force or engine pumps forward and aft. The main pumps are fitted flush with the deck, the brakes occupying a vertical position. The space left to be occupied by the propeller is 7 feet by 8. The over-hanging stern is supported upon this deck by 2½ inch iron bolts, running to spar-deck beams at an angle of 50 degrees; also by bolts, horizontally, from the outside of the ship, through spar-deck beams. The part forming the forward portion of the propeller space, or dead-wood, is of live oak.

"The gun-deck beams side 17 inches, moulded 14, parallel, and are of hard pine. They are supported by two lodge and hanging knees at one beam, and by two dagger knees at the next, thus making three at each alternate beam. The hanging knees side 10 inches, and have 1⅜ inch bolts through each timber, driven from the outside and clinched. Clamps fill the space between the berth and gun-decks, and are of white oak plank, 7 inches thick.

"Besides the usual hatches, there are two ventilating hatches, above the boilers. With a continued view to strength, seven strakes, of 6 inch hard pine plank, are set into beams next the hatches, and dowelled together. There are, besides, five thick strakes next the water-way, 8 inches thick, bolted through and through, with 1¼ inch bolts. The planking of this deck is of hard pine, 5 inches thick.

"The spar-deck is 281 feet long, from the knight-heads to the taffrail, and is of 52 feet 2 inches moulded breadth. The wales are 14 inches thick, seven on each side, which makes 53 feet 4 inches the actual measurement. This deck is pierced for 28 guns, exclusive of long ports to admit of two large 10-inch pivot guns, fore and aft. Two capstans are upon this deck, intended to act in conjunction with those below. The spar-deck beams

sided 17 inches, 13 moulded. They are supported by hanging and lodge knees at each beam, fastened by bolts driven from the outside, and clinched. The underside of rail is 3 feet 8 inches high.

"The wales contain two through bolts clinched on the inside, and two short fastenings in each frame. Her bolts are all copper below one foot above the berth-deck water-way. There has been driven into her hull 226,740 pounds of iron, and 139,778 pounds of bolt copper, 1½, 1¼, ⅞, and ¾ inch in diameter. It is supposed that she will be steered by a quadrant on the afterside of the rudder.

"The measurement of the ship is by carpenter's tonnage 3,800 tons, and she is about 4,000 tons capacity. Draught of water, 23 feet.

"For the armament, it is intended to supply her with two 10-inch pivot guns, weighing over 10,000 lbs. each, twenty-four 9-inch carriage guns, and fourteen heavy 8-inch broadside guns, weighing 6,300 lbs. each. The guns and carriages are of peculiar construction; the former very large at the breech, and beginning to taper abruptly near the centre, terminating small at the muzzle. They are casting at Alger's foundry, South Boston. These guns are provided with an elevating screw, and will elevate 9° 45′ and depress 7° 30′. They are provided with carriages of a new model, having no after trucks. The guns thus provided will be more steady upon the deck, and not so liable to break from their breechings, at sea, while in firing, the recoil will be sufficient to throw them back. The masts and spars are as follows:—

"Mainmast—Above spar-deck 86 feet 9 in., diameter at the partners 42 in., masthead 19 ft. 8 in., topmast 68 feet, diameter at cap 21 in., masthead 10 feet 10 in., main top-gallantmast 34 feet, diameter 12¼ in., royal 23 feet, pole 10 feet 5 in., mainyard 110 feet 4 in., diameter 25¾ in., arm 4 feet 6 in., topsail yard 33 feet 4 in., diameter 20½ in., arm 7 feet 4 in., topgallant yard 52 feet 3 in., diameter 10¼ in., arm 2 feet 9 in., royal yard 35 feet, diameter 7 in., arm 1 foot 9 in.

"Foremast—Above spar-deck 78 feet 9 in., diameter at partners 38 in., masthead 18 feet 2 in., topmast 62 feet 6 in., diameter at cap 21 in., masthead 10 feet, fore top-gallantmast 31 feet 3 in., diameter 12¼ in., royalmast 21 feet 3 in., pole 5 feet, fore-yard 99 feet 4 in., diameter 23¼ in., arm 4 feet 2 in., topsail-yard 75 feet, diameter 18¾ in., arm 4 feet 2 in., topgallant-yard 47 feet, diameter 9⅜ in., arm 2 feet 7 in., royal-yard 31 feet 6 in., diameter 6½ in., arm 1 foot 8 in.

"Mizzenmast—Above spar-deck 72 feet 5 in., diameter 28 in., length of mast-head 8 feet 3 in., topmast 51 feet, diameter 15 in., mast-head 8 ft. 3 in., topgallant-mast 25 feet 6 in., diameter 9 in., royal 17 feet 4 in., pole 4 feet, crossjack-yard 81 feet, diameter 17¾ in., arm 3 feet 6 in., topsail-yard 61 feet, diameter 15 in., arm 5 feet 6 in., topgallant-yard 38 feet 2 in., diameter 7½ in., arm 2 feet 1 in., royal-yard 25 feet 6 in., diameter 5 in., arm 1

foot 4 in., spanker-boom 58 feet, diameter 13 in., pole 2 feet, gaff 41 feet, diameter 8½ in., pole 5 feet.

"Bowsprit—Outboard 36 feet, diameter 38 in., jibboom 27 feet, diameter 17 in., flying-jibboom 20 feet 3 in., diameter 10½ in., pole 3 feet.

"A single suit of sails will contain 13,830 yards, equal to 58,372 square feet."

DIMENSIONS AND SPARS OF THE "NIAGARA," BUILDING AT BROOKLYN NAVY YARD.

We are indebted to the politeness of George Steers, Esq., naval constructor on special service, who has been called from the yards of private enterprise, and intrusted by the Secretary of the Navy with the design and construction of the largest war steamer in America, and intended to excel all others, old or new, in the navy of the United States, for many particulars of the "Niagara," which will be furnished to our readers in due season.

Having been personally cognizant of the finest specimens of marine and naval architecture in this country, for at least fifteen years past, we pronounce the frigate "Niagara" unequalled, in size, symmetry, and construction.

Her dimensions are as follows:—

Length on deck,	345 feet.
Breadth extreme,	55 "
Depth of hold,	31 "
Draught of water in fighting trim,	23 "

SPARS FOR "NIAGARA."

	Length.	Diam.	Heads.	Yards.	Diameter.	Arms.
Mainmast	111 0	37½	18.6	101 0	24	5.0
" Topmast	67 8	21	11.3	76.11	19¼	6.0
" Topgallant	35.4	12½	....	51.3	11½	4.0
" Royal	23.7	8¼	....	32.9	8	2.0
" Skysail	14.6	6	....	21.0	5¾	1.3
Pole	9.0	....	....		....	....
Foremast	101.0	35	16.8	90.9	22	5.0
" Topmast	59.0	20¼	9.10	67.9	16⅞	6.0
" Topgallant	31.10	11¾	....	47.3	11	3.8
" Royal	21.6	7½	....	31.9	7½	2.0
" Skysail	13.3	5¾	....	19.6	5¾	1.3
Pole	8.0	....	....		....	....

	Length.	Diam.	Heads.	Yards.	Diameter.	Arms.
Mizzenmast	85.9	32	16.0	72.10	15½	6.0
" Topmast	50.4	15	8.4	51.3	11½	4.4
" Topgallant	27.9	8⅞	....	34.10	8	2.0
" Royal	18.0	....	....	22.3	6	1.6
" Skysail	11.4	....	....	15.11	4½	1.3
Pole	7.0	....	....	....	....	....
Swinging-boom	62.0	11½	....	35.6	8	....
Maintop stud-sail boom	55 0	11	....	31.0	7	....
" Topgallant " "	41.0	8¾	....	23.0	5½	....
" Royal " "	28 0	5⅝	....	17.0	4	....
" Skysail " "	18.0	3½	....	11.0	2½	....

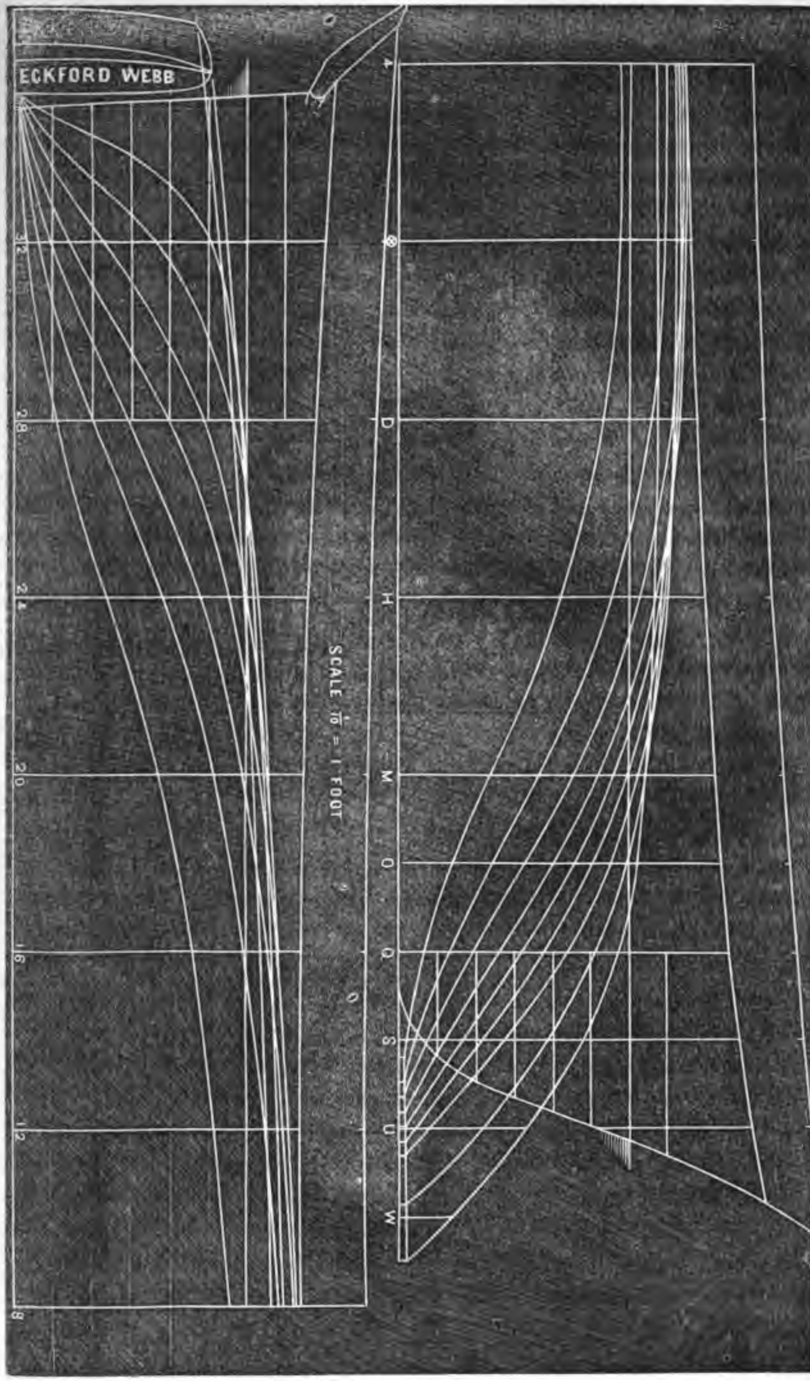
Bowsprit 20 ft. outw'd.	....	23 × 24 inches in knight-heads.
Jibboom 18 "	38 0	13 inches in cap.
Flying " 13 "	33.0	
Pole	5.6	

Spanker-boom	67.0	15	5 feet off for pole.
" gaff	43 0	10½	4 " "
Main spanker-gaff	42.8	9½	2 " "
Fore "	41.3	9	2 " "

THE SCHOONER ECKFORD WEBB.

It is with pleasure as well as pride we bring before our readers a class of vessels which not only demonstrates the truth of that principle in maritime construction which we have labored to show would lead not only to the security of life and property, but to financial success. In this vessel we have another instance of the folly of endeavoring to regulate the interests of ship owners by process of law. In the double-decked vessel we are told that breadth is injurious, but in the single-decked vessel the same parties tell us that breadth is a most advantageous qualification, even though the vessel have two decks, but so arranged that she is measured but as a single-decked vessel—the difference consists only in the mode of measuring for tonnage.

This vessel is regarded as one of the finest of her class ever constructed. Her builder, Mr. Webb, whose name she bears, has kindly furnished us with her lines and details of construction, which will doubtless be examined with interest by the *noisseur* in ship-building.


ECKFORD WEBB
SCALE 1/10" = 1 FOOT

Her length between perpendiculars, is 130 feet; extreme breadth, 30 feet 9 inches; depth of hold, 12 feet 6 inches. The frame is of the very best of white oak, is moulded 14 inches at keel, 11 inches at floor heads, and 6 inches at top height; floors side from 10 to 12 inches, futtocks 8 to 9 inches, tops 8 inches; keel sided 13 inches, moulded 15 inches, with a shoe of 4 inches; keelson sides 13 inches, moulded 15 inches, and in two depths with sister keelsons of 8 by 12 inches. Her ceiling, on the flat of the floor, is 3 inches thick, of oak, the balance of ceiling yellow pine, 3 streaks of 8 inches thick, then 3 streaks of 7 inches thick, then 3 streaks of 6 inches thick, clamps 6 inches thick; the balance of ceiling 5 inches thick. The wales are of 4½ inch oak plank, diminished to the thickness of the bottom plank, which are 3 inches thick, of the best white oak. The garboard streak being 5 inches thick, fastened with bolts and treenails. The ceiling is square fastened with iron bolts, and the planking is square fastened with treenails, and butt-bolted. The deck beams are sided 12 and 13 inches, moulded 10 at centre, 7 inches at ends, and are 6 feet between centres. The beams are all double-kneed, with hanging knees under each beam. Decks are all 3 inches thick. The water-ways are sided, and moulded 12 inches, with a strake 3 inches thick, 7 inches wide on the top of water-way, which extends the timbers above the fastening in knees and water-ways, and makes two more streaks of planking on the outside than usual. The plankshear is 21 inches from the top of deck; the rail is 5 feet 2 inches above deck, and are each 5 inches thick. She has a poop deck 82 feet long, to which is attached a house 12 by 16 feet, for galley and forecastle, well secured with knees, &c. The masts are all of equal length, 89 feet long, 26 inches diameter, with topmast 52 feet long on fore and mizzen, and 54 feet long on main—12 inches in diameter. The fore and main booms are 39 feet long; spanker 58 feet long; fore, main and spanker gaffs 38 feet long; bowsprit, out-board, 27 feet long; jib-boom 20 feet long; flying jib-boom 14 feet long; pole 4 feet long. The vessel is painted white, and is ornamented with a head of an eagle for figure-head, and has a small neat taffrail on the stern, with a likeness of the builder, her namesake, in the centre. She is intended for the Southern business.

Her proportions stand thus—2.67 times depth from lower side of rabbet to top of beam for breadth, 4.43 times extreme breadth for length between perpendiculars.

The masts are stationed as follows:—

Foremast is two feet six inches forward of frame M; mainmast 13 inches aft of frame 4; mizzen-mast, 4 feet 6 inches forward of frame 21. The steps of masts are 35 inches above the floors. Rake, 1½ inches to the foot. Elevation of bowsprit, 4 inches to the foot.

CALCULATIONS.

	Feet.
Length on 6th water-line for calculations......................	128.75
Height of 6th water-line above base..........................	12.00
Breadth on 6th water-line, moulded..........................	30.00
Launching draught forward..	6.50
" " aft..	7.50
(With 23 tons of stone in her, most of it was aft of centre of length of vessel.)	
Area of 6th water-line section in square feet...........3074.21	
Exponent of the same.............................. 0.79	
Centre of gravity of 6th water-line forward of centre of length..	0.20
Location of greatest transverse section forward of mid length..	17.48
Moulded displacement in cubic feet..................28524.28	
" " in tons....................... 812.12	
Exponent of the displacement...................... 0.64	
Centre of gravity below 6th water-line.........................	5.09
" " " forward of mid length.......................	2.12

Launched April 11th, 1855.
Sailed for Savannah and a market.
Drawing forward, 9.00 feet
" aft, 9.66

MR. J. SCOTT RUSSELL ON SHIP CONSTRUCTION.

During a discussion, which took place at the Society of Arts, on Wednesday the 16th instant, after the reading of a paper by Mr. Charles Atherton, chief engineer of Woolwich Dockyard, on Steamship Capability, Mr. J. Scott Russell made some very important observations, to the accuracy of which, with respect both to the mercantile and royal services, we can ourselves bear unqualified testimony. Investigations of this nature, he said, were of the utmost importance, because many might fancy it was the ship-builder who controlled the design of a ship, but practically it was not so, but the owner of the ship who dictated her form. A builder was generally trammelled by conditions and limitations, that left him little choice except to suit the preconceived notions of his customers; and, therefore, unless the general public were enlight-

ened, unless shipowners were enlightened, unless they took an interest in a good ship, in a handsome ship, with a good set of engines in her, and became critics of ship-building, they would not have that stimulus applied to the owners of ships which was the sole means of permitting the builders, or, if they liked it, of compelling the builders, to obtain the best possible results. Therefore such discussions as this were highly important. He believed that it was the want of a general diffusion of knowledge on this subject that led to such dreadful blunders, not in the Royal Navy alone, but wherever a number of people had to do something for which no one was responsible. *Here are our practical men of business earnestly longing to do something for the assistance of the country in its present difficulties, and we could not do it for want of an organization which would enable us to give the government the entire benefit of our resources and our best services.* They all longed to see some practical way in which some good could be done, in order to turn all the mechanical powers of England into the service of the government at this moment; and if that were done, it would sweep away the resistance of any other country to us. But here was the difficulty, and he was afraid his lordship could not help them out of it. There were no people who knew better than the servants of the government this fact—that they could not, even when servants of the government, get the proper scope for their energy and talents; and the reason was this—"THE WANT OF PERSONAL RESPONSIBILITY." The construction of a steamship for the government, if it were the sole work of one man, whose name was openly attached to it as solely responsible for its success, would run a very fair chance of success; but wherever such works were done by boards instead of by individuals, the difficulties in the way of success were nearly insuperable, because personal responsibility was at an end. Instead of this, it was "an office" that did the work, and not the individual. Out came the office plan —the office plan was built. If it succeeded, there were twenty people ready to claim the authorship of it; but if it failed, pity the poor gentleman who originally drew it! For success in steam navigation, the name of one individual should

be identified with each ship, as personally responsible for her, from the laying of the keel to her final repose in the breaker's yard; and with personal responsibility you would have good ships. If it were possible for the government of this country to make one individual publicly responsible for the success of every separate piece of work done, to attach the name of one individual who really had the doing of that thing to his work in so unmistakable a manner that he should have all the credit and all the discredit of doing that thing well or ill—if it were possible that each working head of every department, down to the lowest, were personally responsible for all those below him, and these in turn responsible only to those immediately over them, then public works might be managed much in the same way as private works were conducted, and with equally good results. He feared, however, that our system of parliamentary government was hardly compatible with such a system of extensive personal responsibility.—*Mechs. Mag., London.*

WHAT THE U. S. NAVY WOULD BE IF ADAPTED TO THE AGE.

It is not in the least surprising to those who are familiar with the manner in which naval operations progress, that it should occupy a position low in the scale of improvements. It is to be hoped that the retired list, when completed, will relieve the department from those potations of State fogyism, which have ever been the bane of this arm of the government, under every administration. The present Secretary is one of the very few who have dared, in any degree, to restrain the tide of influence brought to bear upon the Department. From time to time, within our own knowledge, efforts have been made to improve the efficiency of the Navy, by those who have had its best interests at heart, but in every instance they have been compelled to resign, or bend to the wishes of the *Blue, Red and White,* as the representatives, not only of themselves, but of the subordinate commands; and they have learned, after a toilsome strife, the truth of an expression which fell upon our own ear, from an officer "in the Navy,"—"whoever undertakes the introduction of

improvements in the Navy, *must kick against the pricks.*" Whoever doubts this, let him obtain permission to occupy a seat in the office of the Secretary of the Navy, for a single week.

We are well assured that the present Secretary has made an effort in the right direction, and if he succeed but in the smallest degree, he will deserve, and will, doubtless, secure the thanks of every patriot in the United States. The six steam frigates, the revival of the apprentice system, and the retired list, are all worthy of the present Secretary, by whom they were introduced. The want of seamen has also engaged his attention. It is, indeed, mortifying, that a want of seamen should be felt in the United States Navy, the right arm of defence to the greatest commercial nation on the globe. This would not have been the case, had the apprentice system of promotion been continued, we believe, by the Hon. Mr. Paulding.

We never heard of a large ship being kept at home, because officers could not be obtained, even under the rule of seniority, where gray hairs are one of the qualifications, and sometimes the only one. The time was, when those who entered the service under this rule had nothing to do but make haste and get old, and then they would be sure to get either a *civil* appointment, a large ship, perhaps the *Pennsylvania,* a naval station for three years, and then a chance to wait orders for 10 or 20 years; then nothing hindered all the officers from the enjoyment of these luxuries, but *time.* As soon as they got old, it was all right; it was not of so much consequence how much they had learned, or whether the stowage capacity was sufficient to contain all they could have learned; this was not inquired into. But, alas for this *age of improvement,* nothing stands still, nothing perpetual *but change—perpetual motion,* has been found at last; things in the Navy were beginning to assume a quiet aspect, and now there is to be another change, a *retired list* is to be formed. Well, if the *large hulks* go on the same list, what a retired Navy we shall have. If this is really to be so, we shall conclude that the Secretary of the Navy is resolved to make the Navy what it should be in efficiency, and let those Congressmen who voted for large ships be put on the same retired list, and let all go on a *voyage of experience to the Baltic,*

and learn the folly of building ships of heavy draught of water. There might be room for passengers; if so, we know of many who ought to go, by all means, on this voyage of experience, some mechanics among them.

It is a most singular fact, that the government should have always set so much higher estimate upon the navigator than upon the constructor, and this is the key to all the misfortunes of mal-construction in the Navy Department—the low estimates set upon naval constructors. If the marine constructor can realize from $3,000 to $5,000 per year from his business, in proportion to his skill and ability, why should he be expected to work for the government for less? And we may here remark, that if the Navy Department would have first class naval constructors, it must pay the price. We know of no private shipbuilder of the first water, who cannot realize as much from his business, and who is not regarded as being equally as valuable to the community in which he lives, as any officer in the Navy of the United States; and if so, why should he be expected to render service for less remuneration?

It is a notorious truth, that marine construction requires more skill than naval, and perhaps this is the reason why the department pays less. We think there is not much doubt but that the new ship Niagara will sufficiently prove this; and if Mr. Steers will only be allowed to make a trial trip, in company with any one of the fine vessels built in the other Navy Yards, the command for the occasion being conferred on the captain of one of our clipper ships, we shall see, in part, what the U. S. Navy would be, if adapted to the age.

The New-Bedford *Standard* mentions that two whale-ships, owned by one firm, and built by the same shipwrights, are now lying at the same wharf in that city, each of them having made the greatest voyage of the kind ever known. The William Hamilton made the largest sperm whale voyage that was ever secured in the world, taking during a voyage, some fifteen years ago, 4,181 barrels of sperm oil. The George Washington also made the greatest right whale voyage that was ever taken, on her last voyage securing 7,000 barrels of whale oil.

NAVAL COMMISSIONS.

Two naval commissions have recently been appointed by the Hon. Secretary of the Navy; one to inquire into the feasibility of increasing the amount of longitudinal strength, and consequent safety, by means of an additional and better application of iron in wooden vessels, as recently adopted in the United States marine. The commission in this case seemed to have lost sight of the object for which it was convened, and directed their attention to the feasibility of air-chambers, &c. We might entertain our readers with a "meal of mirth," and excite a hearty laugh at the expense of those gentlemen, by merely publishing the whole correspondence, with the remarks, which has been placed in our possession for this purpose; but for the honor of the Department we forbear at present.

The second commission referred to, was appointed to consider the practicability of Mr. Thomas Maskell's Slide-Keel, illustrated on page 38, vol. 2, of the NAUTICAL MAGAZINE. We publish the following report of the commission:—

WASHINGTON NAVY YARD, *May 31st*, 1855.

SIR:—Agreeably to your order of this date, to examine the "Patent Toggle-joint Slide-Keel," submitted by Mr. Thomas Maskell, we have the honor to report, that in our opinion the Toggle-joint Slide-Keel could be advantageously applied to small class vessels requiring a light draught of water.

We have the honor to be, sir,
Your obedient servants,
JOSEPH LANMAN,
Lieut. U. S. Navy.
S. M. POOK, *N. C.*
JOHN RAINBOW, *Carpenter.*

Commodore H. PAULDING,
Commd't Washington Navy Yard.

The Admiralty Court, London, awarded £16,000 as salvage to the ship Marathon, in the case of the ship John Cheston, of Baltimore, which vessel was fallen in with, abandoned, by the Marathon, and taken into Liverpool.

EARLY SHIP-BUILDING & NAVIGATION IN AMERICA.

According to Stradley, Popham's Colony, in Maine, built the first vessel ever constructed in New-England, in 1607. This vessel was a pinnace of 30 tons, and called the *Virginia*. She was built at the mouth of the Kennebec River, and made a successful voyage across the Atlantic.

The first vessel built in Plymouth Colony, was the *Blessing of the Bay,* not materially differing in size from the Virginia; she was launched on the 4th of July, 1631; her frame was Locust. The place is now known by the name of the Ten Hill's Farm, Medford, where so many ships have been built.

On January 24, 1641, Edward Bangs launched at Plymouth a vessel of 40 to 50 tons, estimated to cost £200, and she is recorded as the first vessel of the size built in the colony.

In 1647, the people of New-Haven, to repair their losses on the Delaware, built and freighted a vessel for England, which foundered at sea, and was never heard of afterward, except in the following remarkable manner:

"In June next ensuing, after a great thunder storm, about an hour before sunset, a ship of like dimensions, with her canvas and colors abroad, appeared in the air coming up the harbor, against the wind, for the space of half an hour. 'Many,' says the Rev. Mr. Pierpont, 'were drawn to behold this great work of God; Yea! the very children cried out, 'There is a brave ship!' When so near that a man might hurl a stone on board, her maintop seemed blown off, then her mizzen-top, then her masting seemed blown away by the board, she overset, and so vanished into a smoky cloud. The vision was given, in the opinion of the beholders, that they might understand the tragic end of the ship and their friends.' "

These vessels were all ships of size for those days. We, of the present generation, can scarcely realize the little decked boats in which the early navigators traversed the ocean only two or three centuries ago. Could they revisit the earth, they would be amazed at the improvements in the construction, comfort and security of the vessels of this day, as well as their enormous size. Hume relates, that in 1582, of 1232 vessels be-

longing to the kingdom of Great Britain, only 217 were over 80 tons. A vessel of 40 tons, the same author says, was considered a large vessel; and six years subsequent there were not five vessels fitted out in all England, whose size exceeded 200 tons. Only one of the vessels that comprised the fleet of Columbus had any deck; the remainder, according to Irving, were not superior to the smallest class of modern coasting vessels. In his third voyage, when coasting the Gulf of Para, Columbus complained of the size of his ship, it being nearly 100 tons burthen. The Mayflower, which, in 1620, brought over the pilgrim fathers, numbered only 180 tons.

"The *Half-Moon*," as the "Vlie-Boat" was called, in which Henry Hudson discovered New-York Bay, in 1609, was only 80 tons. She was fitted out for Hudson by the Dutch East India Company, and manned by a crew of twenty sailors, partly Dutch and partly English. The *Half Moon* left Amsterdam on the 4th of April, 1609. Early in July it reached the Banks of Newfoundland. Touching at Cape Cod, and then straying off to the mouth of the Chesapeake, looking in at Delaware Bay, and still groping along to the northward, on the evening of September 2, 1609, Hudson came in sight of the "high hills" of Navesinck, and on the next evening anchored in Sandy Hook Bay.

Hudson ascended the North River as far as the present site of Albany, and was eleven days sailing up, and as many more drifting down. On the 9th of October, Hudson set sail from Sandy Hook, and steered into the main sea. Steering Eastward for a month, without seeing any land by the way, on the 7th of November, 1609, he arrived safely at Dartmouth, in Devonshire.

Hudson himself never revisited the river which bears his name, but the *Half Moon* did, while Hudson, in attempting to explore the Northern Ocean, was abandoned by his mutinous crew in a boat, and left to perish among fields of ice in the bay which is called after him.

Though ships of 500 tons, at the commencement of the present century, were considered almost too large to manage, we hear of ships in the beginning of the seventeenth century, and

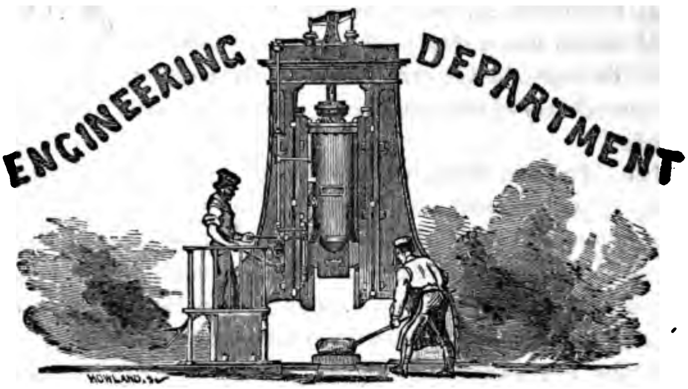
at the same date as the *Blessing of the Bay* and *Virginia*, and others, of quite large size, even for these times, thus: Captain James Lancaster, in 1613, commanded a fleet of five vessels, one of which was a ship of 600 tons, one 800, two of 200, and one of 130 tons; and in the Straits of Malacca he "captured a Portuguese ship of 900 tons, laden with the valuable productions of India."

When Captain Saris visited Japan, in 1613, he mentions seeing a junk of 800 or a 1000 tons; so that at that time their vessels compared in size, if they did not exceed, those of Europe. Edward VI.'s navy consisted of 53 ships, but only 28 of them were above 80 tons. Queen Elizabeth, at her death, left a navy of 42 vessels, but only two were a thousand tons burthen.

At the commencement of the present century (1800), the largest vessels in the British Navy were 2,300 tons only; the largest in the French Navy, 2,850; and the Spaniards had one larger, but she was pronounced too unwieldy a monster to go to sea. Ralph Willet, writing on ship-building, in that year, says, "If our ships be made a great deal larger, they might answer the purpose of parade and vanity, as in the case of the two ships built by the French and Spaniards."

The largest vessel ever built, however, was also the first of which we have any record, viz.: Noah's Ark; she was, according to Biblical description, a three-decker, 547 feet in length, and her tonnage has been estimated at 42,413 tons, or eight times as large as the "GREAT REPUBLIC."

THE TIMBER EXPERIMENTS BY THE NAVY DEPARTMENT TO BE ABANDONED OR IMPERFECTLY CONDUCTED.—We are pained to learn that the removal of Mr. James Jarvis, Inspector of Timber, at the Gosport Navy Yard, has been consummated by *dishonorable means*, being well persuaded that the honorable Secretary of the Navy has been imposed upon, either by political tricksters, or by Government contractors, to the evil doers of which class, he has always been a terror, and saved the Government thousands of dollars, by ferreting out deception in its thousand forms. We have known him for 25 years, and, as a man of integrity and moral worth, he stands as a beacon to nautical mechanics, (to which class of citizens he belongs,) and all others in the line of his profession. We doubly regret this change, inasmuch as Mr. Jarvis had the charge of those experiments with a *carte blanche* from the Bureau, and we confidently believe that his place cannot be filled. The nautical department of the mechanical world owe a debt of gratitude to him for the discoveries he has made in departments of science never before explored.



ZINC METAL FOR SHIP-BUILDING AND SHEATHING.

The process of smelting this metal from the ore, and that of rolling it in sheets, have, like all other branches of industry, made great progress of late years. Zinc or spelter is now purer, and, after being rolled, more homogeneous and more malleable than it was formerly.

The qualities requisite for a good sheathing metal, viz.: pureness, malleability and durability, have all been found in this metal, which is now extensively manufactured by the "Vieille Montagne" Works, in Belgium and France, not only for this purpose, but for a material to be used in the entire construction of vessels. Zinc cannot be obtained absolutely pure, except in the laboratory of the chemist. This metal, as it is offered to the trade, either in plates or in sheets, is more or less mixed with other substances. The Vieille Montagne zinc, owing to the superior quality of the ore, and the improvements in the smelting operation, is said to be as free from such admixtures as can be required for all practical purposes. Repeated experiments have established the fact, that, of 1000 parts, it contains :—

Pure metal	995 parts.
Alloy	5 "

The correctness of this statement may be ascertained by referring to the officers of the United States Mint, where the V. M. zinc is daily used for purifying precious metals.

The Vieille Montagne Company have authentic testimonials proving that several vessels sheathed with zinc, namely, the *Marie Louise* and *Noemi*, of Nantes; *Amitie*, of St. Malo; *Jean Bart*, of Granville; *Joinville* and *Europe*, of Nantes, have been navigated with their original suit of zinc for eight, nine, and even twelve years. These, however, are exceptional examples; but the duration of a zinc suit in ordinary cases, may be safely estimated, on an average, at six years.

It is not, of course, to be understood that zinc in all cases will last six years; but, apart from the instances of long duration on record, the superiority of zinc in that respect is easily accounted for:—

1. It is used in thicker sheets than either copper or yellow metal.

2. It does not oxidize or corrode as copper or brass by immersion in sea-water; on the contrary, it is covered with an adhesive coat of peroxide, which becomes a permanent protection to the body of the metal.

3. When barnacles or sea-weeds that may have gathered upon it, fall, or are scraped off, the metal remains almost uninjured; while, with a copper or brass sheathing, they commonly leave it greatly thinned, eaten through, and crumbling off.

4. In regard to yellow or Muntz metal sheathing, immersion in sea-water subjects it to a process of molecular decomposition, the effect of which is to deprive it of its tenacity and durability, rendering it so brittle that it can be crushed in the palm of the hand. This fact is unavoidable, viz., yellow metal being composed of about 60 parts of copper and 40 parts of zinc will, by contact with sea-water, undergo a similar operation to that in a Galvanic battery; that of depriving both metals of their affinity to each other.*

With regard to economy, the cost of copper in sheets, in relation to that of zinc, is generally as 3 is to 1; if to this be added

* R. Armstrong, London *Artizan*, January, 1855.

the well known fact, that a suit of copper sheathing seldom lasts more than four years, the economy of using zinc will be self-evident.

The same conclusion applies to brass or yellow metal sheathing, the cost of which is only $\frac{1}{8}$ less than that of copper, and which is acknowledged seldom to last more than three years.

The following estimate of the respective costs of the three different metals for sheathing a vessel of 400 tons, puts the point in question beyond the possibility of controversy. It will be conceded here, for the sake of obviating objections, that *six* years is the period of duration common to all.

COPPER.

570 sheets of 24 oz.	4000 lbs.			
285 " " 26 "	2158 "			
285 " " 28 "	2324 "			
1140	8482 a 30c. per lb.	$2544 60		
Brass nails....	855 a 26c. " "	222 30		
		$2766 90		
Interest 6 years, a 7 per ct........		1162 10		
		3929 00		
Less value of old copper, 4241 lbs. a 20c.		848 20		
Net cost after 6 years................		$3080 80	3080 80	

YELLOW METAL.

570 sheets of 20 oz.	3324 lbs.		
285 " " 22 "	1829 "		
285 " " 24 "	1995 "		
1140	7148 a 26c. per lb.	$1858 48	
Nails........	855 a 26c. "	222 30	
		$2080 78	
Interest 6 years, a 7 per ct........		873 93	
		2954 71	
Less value of 3574 lbs. old metal a 13c.		464 62	
Net cost after 6 years............		$2490 09	2490 09

ZINC.

570 sheets of 27 oz.	4189 lbs.		
285 " " 30 "	2494 "		
285 " " 32 "	2660 "		
1140	9343 " a 9c. per lb.	$840 87	
Zinc nails....	760 " a 16c. "	121 60	
		$962 47	
Interest 6 years, a 7 per ct........		404 24	
		1366 71	
Less 4671 lbs. old metal a 3c......		140 13	
Net cost after 6 years............		$1226 58	1226 58

The vessels sheathed with zinc, since its introduction, shows a steady increase of its adoption, for that purpose, as is evident from the French *Veritas*, or Lloyds' List, which contained, in 1850, the names of 1400 vessels so sheathed on the continent; and the Vieille Montagne Company have records of nearly the same number since 1848 to the end of 1854, in the various ports of England and North America.

Sheathing zinc is of the same size, viz., 14 by 48 inches, and is punched and nailed absolutely in the same manner, as copper or yellow metal.

Three gauges are commonly used—15 of 27 oz., 16 of 30 oz., and 17 of 32 oz.; the proper nails to use with this sheathing are the 1⅛ and 1¼ inch wrought zinc nails, 200 to 220 to the pound.

The sheets are imported in cases of 550 pounds. Those of No. 15 gauge contain 80 sheets; 16—74 sheets; 17—65 sheets. Zinc nails are shipped in 1 cwt. kegs.

If the vessel to be sheathed is *iron fastened, so much the better*, as zinc preserves iron, while, on the contrary, copper destroys it by its injurious galvanic action.

If the vessel is copper or brass fastened, it is necessary to *isolate* as much as possible these fastenings, by first lining the hull with tarred felt or sheathing paper. The galvanic current that otherwise might exist between the two metals, is prevented by this lining.

It is well known that all metals are more or less rendered

brittle by cold. When a vessel must be sheathed with zinc in frosty weather, the brittleness will be prevented by immersing the sheets and nails in warm water; this may appear a troublesome precaution, but its utility amply compensates for the trouble of keeping some water hot in the tar kettle.

Zinc Bolts for Fastening Vessels.—Zinc can be rolled in bars of all sizes, like copper and brass, and it was proposed a few years ago to use it instead of the old metals for fastening vessels, showing at the same time that such substitution would be productive of a considerable saving in the construction of all kinds of ships.

This, however, being an entirely new application of zinc, it could not be expected that the suggestion would be immediately acted upon. The public must be convinced first that zinc bolts could be used with the same facility, and possessed the same strength, as copper or brass bolts.

In order to leave no doubt on those points, the Vieille Montagne Company have caused experiments to be made during 1852, in ten French seaports, publicly, and in the presence, in each, of a great number of owners and masters of vessels, merchants, scientific men, and government functionaries. All these experiments were entirely satisfactory, and proved that zinc bars have all the strength, tenacity and malleability desirable for ship fastenings.

Let us add that the successful application of zinc bolts for fastenings is now no longer a problematical vagary, but an established fact, there being at present afloat a ship of the British navy, the *Albion*, a two-decker, of 90 guns, *entirely zinc fastened.*

It is proper here emphatically to repeat the remark already made with regard to the action of sea-water upon yellow or Muntz metal:—

"In every case in my experience," says Armstrong, "where it has been necessary to have bolts of that metal removed, I have found them broken asunder, or so brittle that the slightest force was sufficient to break them. From the appearance of the metal, its nature seemed to be quite changed, rather resembling broken earthenware than brass."

Sea-water has no such destroying influence on pure zinc bolts, and the sooner the use of such a treacherous material as Muntz metal is abandoned, and that of zinc substituted, the better, as a matter of economy and safety for ships.

CONSTRUCTING SHIPS ENTIRELY OF ZINC.—There could be no more difficulty in building the hull of a vessel of zinc, than building it of iron; on the contrary, its possession of all other requisite properties being established, it is evident that the greater malleability of zinc would facilitate the shaping, boring and riveting of the plates.

The attempt has already been made, and the result has realized the most sanguine expectations of the parties interested. The square-rigged schooner *Comte Lehon*, built of zinc, was launched, in 1854, from M. Guibert's dockyard, at Nantes, and made a first and successful voyage to Rio de Janeiro, whence she sailed for Marseilles, and is now a regular trader.

We are not informed whether or not iron entered at all into the composition of this vessel; but we think it would be preferable for the skeleton parts.

The zinc plates used in this instance are of No. 8 wire gauge (corresponding to No. 30 zinc gauge;) they overlay each other one inch, and are riveted with wrought zinc rivets, $1\frac{1}{4}$ inch apart.

A zinc vessel, while it is hardly inferior in strength to one of iron, has over the latter many advantages :—

1. It will cause no deviation of the compass.

2. The plates not being liable to corrode or rust, do not require painting.

3. In ordinary cases of collision, while iron would in all probability crack or break, causing a leakage in the vessel, zinc would yield and bend without endangering the safety of the vessel and hands, or interrupting her course.

4. In the event of standing near shore, and in a position and under circumstances allowing salvage, the zinc hull might be cut or sawed in pieces, having a real value, while the iron hull would be abandoned as worthless.

DIMENSIONS OF SHEATHING ZINC.

No. 14—14 in.	× 48 in.	—22 oz.	per	square	foot.
" 15—"	"	—24 "	"	"	
" 16—"	"	—26 "	"	"	
" 17—"	"	—30½"	"	"	
" 18—"	"	—35 "	"	"	

PLATES FOR ZINC VESSELS.

No. 10	Wire	Gauge,	or 28	Zinc	Gauge,	65 oz.	per square foot.
" 9	"	"	or 29	"	"	70 "	" "
" 8	"	"	or 30	"	"	75 "	" "

DESCRIPTION OF SCREW STEAM VESSEL BARWON.

(Continued from page 230.)

Cook-House and Range.—A commodious cook-house to be provided in the deck-house, with shelves, dresser, and other fittings useful in such a place; also a steam-kitchen, or arrangement of pans on shelves, into which steam may be turned from the boiler, so as to boil anything placed in the pans. Also, a cooking apparatus of the most approved Swedish construction, with two large ovens, hot plate, and assortment of articles enumerated in the inventory.

Companions and Sky-Lights.—The companion forward for crew, one large sky-light, with thick plate glass, for engine-room; three blind sky-lights, lined with looking-glass, for lower saloon; three blind sky-lights, lined with looking-glass, for upper saloon. Stairs covered with lead and with brass nose and tread pieces, to be fitted to the lower cabins both fore and aft.

Glass-Case round Stair of Lower Saloon.—A glass-case, with brass doors and gilt pillars and cornice, to be fitted round the stair of the lower after-saloon, for the reception of the silver plate belonging to the ship. This case is to have the back formed of looking-glass, and is to have glass shelves for holding the plates and trays, covered with blue velvet for the reception of spoons, forks, &c. The doors of this case to be provided with locks and keys.

MASTS AND SPARS.

Fore-Mast.—To be 50 feet high above deck; mast-head to be 7 feet high; diameter at partners 16 in.; at hounds 14 in.; at head 10 inches.

Main-Mast.—To be 56 feet high above deck; mast-head, 7 feet; diameter at partners 16 in.; at hounds, 14 inches; at head, 10 inches.

Fore-Top-Mast.—To be 40 feet high; from heel to first hounds, 24 feet; from first to second hounds, 12 feet; spire, 4 feet; heel, 10 inches; cap, 10 inches; first hounds, 8 inches; second hounds, 6 inches; end, 3 inches.

Main-Top-Mast.—To be same as fore-top-mast.

Bowsprit.—Out board, 15 feet; partners, 15 inches; end, 10 inches.

Jib-Boom.—30 feet long; cap, 9 inches; hounds, 8 inches; end, 5 inches.

Fore and Main-Yards.—52 ft. long; 12 inches diameter at middle, and 6 inches at ends.

Fore and Main-Top Sail-Yards.—42 feet long; diameter at middle, 10 inches; at ends, 5 inches.

Fore and Main-Top Gallant-Yards.—To be 32 feet long; diameter at middle, 7 inches; at ends, 3½ inches.

Fore-Gaff.—To be 29 feet long; diameter at jaws, 8 inches; at vangs, 6 inches; fly, 3 feet long; end, 3 inches diameter.

Main-Gaff.—To be 35 feet long; diameter at jaws, 9 inches, at vangs, 7 inches; and fly, 3 feet long; end, 3 in. diameter.

Main-Boom.—To be 53 feet long; sheet, 13 inches diameter; outer end, 10 inches; inner end, 8 inches diameter.

Swinging-Boom.—To be 26 feet long; sheet, 5 in. diameter; ends, 4 inches diameter.

Top-Mast Studding-Sail-Booms.—To be 24 ft. long; crance, 6 in. diameter; ends, 3½ inches.

Top-Gallant Studding-Sail-Booms.—To be 18 feet long; crance, 5 inches diameter; and ends, 3 inches diameter.

ROPES.

STANDING RIGGING.

Spring Fore-Stay	wire rope	$2\frac{7}{8}$	inches.
Fore and Main-Stays	do.	$3\frac{3}{8}$	do.
" Shrouds	do.	$2\frac{7}{8}$	do.
" Top-Mast-Stays	do.	$2\frac{3}{8}$	do.
" " Back-Stays	do.	2	do.
" " Shrouds	do.	$1\frac{3}{4}$	do.
" Top-Gallant-Stays	do.	1	do.
" " Back-Stays	do.	1	do

RUNNING RIGGING.

Fore and Main Lifts	hemp rope	$3\frac{1}{2}$	inches.
" Top-Sail-Lifts	do.	$3\frac{1}{2}$	do.
" Top-Gallant-Lifts	do.	$2\frac{1}{4}$	do.
" Braces	do.	$2\frac{3}{4}$	do.
" Top-Sail-Braces	do.	$2\frac{3}{4}$	do.
" Top-Gallant-Braces	do.	$1\frac{1}{2}$	do.
" Top-Sail-Halyards	do.	$2\frac{1}{2}$	do.
" Top-Gallant-Halyards	do.	$2\frac{3}{4}$	do.
" Peak and Throat-Halyards	do.	3	do.
" Vangs	do.	$2\frac{3}{4}$	do.
" Whips	do.	2	do.
" Brails	do.	24	thread.
" Clue Garnets	do.	$2\frac{1}{2}$	inches.
" Buntlines	do.	$2\frac{1}{2}$	do.
" Top-Sail Clue-lines	do.	$2\frac{1}{2}$	double.
" Top-Gallant Clue-lines	do.	21	thread.
Fore-Spencer-Sheet	do.	3	inches.
Main-Boom-Sheet	do.	$3\frac{1}{4}$	do.
Main-Boom Topping-Lift	do.	$4\frac{1}{2}$	do.
Peak-Halyards (Fore and Main)	chain	7-16	do.
Top-Sail-Sheets do.	do.	$\frac{3}{8}$	do.
" Ties do.	do.	$\frac{1}{2}$	do.
Funnel-Rigging	do.	7-16	do.

BLOCKS.

	Single.	Double.	Size.	
Fore-Brace Blocks	2	0	10	inches.
Main-Brace Blocks	4	0	10	do.
Fore-Top-Sail-Brace Blocks	4	0	8	do.
Main-Top-Sail Braces	4	0	8	do.
Quarter Blocks Top-Sail-Yard	0	4	8	do.
Fore-Clue Garnets	0	2	8	do.
Top-Gallant Clue-Line Blocks	4	0	6	do.
Lignumvitæ Bull's Eyes	2	0	5	do.
Fore and Main Lifts	4	0	7	do.
Lower and Top-Sail Reef-Tackle	8	0	7	do.
Jib and Stay Halyards	2	0	8	do.
Lower Buntlines	0	2	7	do.
[illegible] Lines	2	0	6	do.
[illegible]ntlines	2	0	7	do.
Yard-Rope	0	2	7	do.

	Single.	Double.	Size.	
Top-Sail Halyards	0	2	10	do.
" "	2	0	10	do.
Top-Gallant Halyards	2	0	6	do.
Peak and Throat	0	1	7	do.
"	2	0	7	do.

ANCHORS, CHAIN CABLES, &c.

		cwt.	qrs.	lbs.
1	Cable 100 fath. 1¼ inches, best stud, chain and shackles complete	82	3	20
1	Cable 100 fath. 1¼ inches, best stud, chain and shackles complete	85	0	22
1	Best Iron Stocked Anchor	0	2	1
1	" "	1	0	5
1	" "	5	0	8
1	" "	17	3	22
1	" "	18	3	17
1	Trotman's Patent Anchor	17	2	17
1	Length 50 feet ¾ inches best short-linked chain	2	3	10
1	Length 150 feet ½ inch best short-linked chain	3	2	21
1	Length 150 feet 7-16 inch best short-linked chain	3	0	16
2	" 20 ft. each 7-16 in. " "	1	0	0
2	" 28 ft. " ⅜ in. " "	0	3	5
2	" 30 ft. " 5-16 in. " "	0	2	2
2	" 34 ft. " " " "	0	2	12
2	" 30 ft. " ⅜ " " "	0	3	6
2	" 20 ft. " 7-16 " "	1	0	0
1	" 100 ft. " ⅜ " " "	1	1	16
"	" 200 ft. " 5-16 " "	2	0	16

Sails.—Number of Sails.—Two jibs, two fore-top-mast stay-sails, two fore-stay-sails, one fore-sail, one fore-top-sail, one main-top-sail, one fore-top-gallant-sail, one main-top-gallant, one main-sail, two fore-spencers, two main-spencers, one storm-try-sail, one main-stay-sail, two lower studding-sails, three top-mast studding sails.

Dimensions of each of the Sails.—Jib on stay, 55 ft. 6 in.; luff, 39 ft.; foot, 24 ft. 3 in. Fore-top-mast stay-sail on stay, 49 feet; luff, 36 ft. 6 in.; foot, 46 feet. Fore and main-top-gallant-sails, head, 25 feet; leach, 12 feet 9 inches; foot, 34 feet. Fore and Main top-sails, head, 30 feet; leach, 26 feet; foot, 46 feet. Fore-spencer, head, 25 feet; leach, 49 feet; mast, 33 ft. 6 in.; foot, 50 feet 6 in. Main-stay-sail, on stay, 42 feet; luff, 32 feet 6 inches; foot, 23 feet. Storm (stay-sail,) try-sail, head, 15 feet; leach, 44 feet; mast, 33½ ft.; foot, 32 feet.

Boats.—One Gig.—20 feet long, 5 feet broad, and 2 feet 3 inches deep, copper fastened; timbers oak, 9 inches apart, 1 inch by $\frac{7}{8}$ths half round; planking, of pine, $\frac{1}{2}$ inch thick; keel, of oak or elm, $1\frac{1}{2}$ by 4 inches; stem and stern-post, of English oak, same size at bottom as keel; apron and deadwood, of English oak; upper strake to be of American oak or elm; gunwale, of elm, $1\frac{3}{4}$ in. by $1\frac{1}{2}$ inches; to be clench built, and each plank to be fastened every $4\frac{1}{2}$ in.; every 9 in. through timbers, and every 9 inches through planking; nails through timbers to be copper, $1\frac{1}{2}$ inches long; and clenched nails to be $1\frac{1}{4}$ inches long, and iron stem band and head to be introduced $\frac{1}{8}$ inch thick, and same breadth as keel. To be furnished with 4 ash oars, bound with copper at the ends; rudder with brass yoke, and ropes covered with green cloth; mast and yard with all iron work necessary for the same; iron awning staunchions and brass rowlocks. To be fitted with 4 beams, secured with iron knees extending below beam and pointing upwards; to have stern sheets, with backboard; grating from backboard to stern, grating footboards, and a small grating forward for painter. Ringbolts to be provided forward and aft; also 4 small brass hooks for sail.

One Carvel-built Boat.—24 feet long, $2\frac{1}{2}$ feet deep and $5\frac{1}{2}$ feet broad, copper fastened; timbers oak, 9 inches apart, $1\frac{1}{4}$ by $1\frac{1}{8}$ half round; planking of pine $\frac{3}{4}$ inch thick; hardwood upper strake of oak or elm $\frac{3}{4}$ thick; gunwale of elm or oak 2 in. by $2\frac{1}{4}$ thick, to be fastened with $1\frac{1}{2}$ cast composition nails, two into each timber; the four upper pine strakes to be not more than $4\frac{1}{2}$ inches broad, and to be in one length; the rest of the strakes to be not more than 5 inches broad. To be provided with 5 ash oars, bound with copper at the ends, rudder and tiller, two masts and gaffs and one bowsprit, with all necessary iron work complete; iron rowlocks, ringbolts at stem and stern, clenched on rings, and an anchor davit of English oak, $4\frac{1}{2}$ in. square, with sheave to be so fitted as to be susceptible of transfer from one boat to another. To be provided with foot-gratings and grating for painter, and to be in other respects the same as the gig above described. Each beam to be secured at each end by an iron knee $1\frac{1}{2}$ inches broad, $\frac{1}{4}$ thick at point, $\frac{3}{8}$ths thick at throat; the tail along the beam to be 12 inches long, secured

by 3 screws to each tail; tail on side to point upward and to be as long as possible.

Life Boats.—Two boats, each 20 feet long, $2\frac{1}{2}$ feet deep and $5\frac{1}{2}$ feet broad, each built like whaleboats; timbers oak, $1\frac{1}{4}$ by $1\frac{1}{8}$ and 9 inches apart; planking of $\frac{3}{4}$ inch yellow pine; the fastenings to be the same as in the boats already described, but gunwale strake to be nailed to each timber and clenched. Four feet at each end to be fitted as water-tight compartments, decked with 1 inch pine, and bulkheads fore and aft to be formed of two thicknesses of $\frac{1}{2}$ inch pine, with felt interposed; listing for attachment of bulkheads $1\frac{1}{2}$ in. square pine, put on with white lead, and nailed with copper nails and clenched. A small water-tight hatch to be made in top of each compartment. Each boat to be provided with four ash oars, bound at ends; one mast and gaff, rowlocks, ringbolts in stem and stern, and all other fastenings or fittings same as boats above described. Each boat to be fitted with a 6 inch zinc pipe inside gunwale, of 20 wire gauge in thickness, and extending along from fore to aft bulkhead on each side. These pipes to be water-tight, so that these two last boats may be life boats; the zinc pipes to be covered with $\frac{1}{2}$ inch pine, laid on in the rounded form. Each life boat to have an iron rowlock to fit either at the bow or stern into iron sockets. Each of the above boats to be provided with a suitable boat-hook, and the gig to have two boat-hooks.

BIDEN'S PATENT IMPROVEMENTS IN MARINE STEAM ENGINES.

The increased extent to which high pressure steam is now coming into use, renders it necessary that all accessory contrivances for improving the effectiveness and economy of engines should be made available. At present there is excessive waste in our modes of condensation, and boilers are rapidly destroyed by the injurious action of salt water upon them.

It is well known, and has been frequently shown by experiment, that steam is readily condensed by being passed through a metallic conduit immersed in a constant stream of cold water. Symington and others availed themselves of this mode of condensation. Mr. Biden contemplates in his patent the adaptation of this system to high-pressure engines, so as to return the condensed steam, as water, at nearly boiling temperature, into a

reservoir, whence it is to be pumped back into the boiler. The temperature of this returned water may, of course, be regulated by the length and size of the pipe or conduit through which it is passed, these being determined also by the pressure at which the steam leaves the cylinders.

The great advantages resulting from this arrangement are easily seen. The duration of the boilers employed in connection with it would be much increased, and the expenditure of fuel would be necessarily diminished.

The patentee provides two safety or escape valves: one to carry the steam which passes off when the engine is stopped to the condenser—the other, which is a little more weighted, to ensure safety, should the first, by neglect or accident, get out of order.—*Lon. Mech's. Mag.*

THE ULTIMATUM OF THE ERICSSON.

THE famous *hot-air* ship Ericsson, about which so much has been said in the nautical world, has at length been completed in her propelling power, and sailed from New-York for Havre, France, on the 16th day of June. Before going upon the berth, she made a lengthy trial trip, the superintendence of her machinery being given to Chas. H. Haswell, Engineer for the occasion, by the owner, J. B. Kitching, Esq., who was furnished with the following report of the performances of the ship, by Mr. Haswell, upon his return, which we are furnished for publication:—

NEW-YORK, *May* 30, 1855.

DEAR SIR:—Having, in compliance with your request, embarked on board the steamship Ericsson, on the 28th inst., for the purpose of witnessing the performance of her machinery, and having received authority from you to control the operations of it in such a manner as I saw fit, for the purpose of advising myself of the consumption of fuel in her furnaces, speed of vessel, &c., I have now to submit the following report of my observations; and for the purposes of ready comparison and estimate of the value of the elements submitted, I give the following particulars of hull and machinery:

Hull—Length on deck, 250 feet; breadth of beam, 40 feet; depth of hold, 27 feet.

Draught of Water—Forward, 17 feet 2 inches; aft, 16 feet 10 inches, (mean 17 feet.)

Coal and Water on Board—550 tons.

Area of immersed midship section at this draught—546 square feet.

Machinery—Two inclined engines of direct action.

Cylinders—62 inches in diameter by 7 feet 8 inches stroke of piston.

Water Wheels—32 feet in diameter by 10 feet in width.

Boilers—Two vertical tubular, supplied by fresh water from the external condensation of the steam: natural draught to furnaces.

Cut Off—Drop valve with adjustable arrangement, set in this experiment at 45-100ths of stroke of piston.

Dip of Water-Wheel Blades—4 feet 6 inches.

Coal—Anthracite, Pittston, Bituminous, and Cumberland.

Results of Experiment.—1st. *Anthracite.* At sea, May 28th, 1.45 P.M. to 2.15 A.M.; 29th, 12 hours and 30 minutes, consumed 26,400 lbs.: 2,112 lbs. per hour, or 0.94 of a ton (of 2,240 lbs.) per hour.

2d. *Bituminous*—At sea, May 29th, 2.15 to 11.30 A.M., 9 hours and 15 minutes, consumed 15,390 lbs.: 1,664 lbs. per hour, or 0.74 of a ton per hour.

3d. *Anthracite*—At sea, May 29th, 11.30 A.M. to 1.45 P.M., 2 hours and 15 minutes, consumed 4,320 lbs.: 1,920 lbs. per hour, or 0.85 of a ton per hour.

RECAPITULATION.

1st.	12 hours	30 minutes,	× 2,112 lbs.	=	26,400 lbs.
2d.	9 "	15 "	× 1,664 lbs.	=	15,392 lbs.
3d.	2 "	15 "	× 1,920 lbs.	=	4,320 lbs.
	24 hours	0 minutes,			46,112 lbs.

the total consumption for 24 hours = 20.58 tons.

The average pressure of the steam was 22 5-8 lbs. per square inch; the vacuum 27 1-2 inches, and the average revolutions of the engines 13 3-8 per minute. The speed of the vessel, as measured by a chip log, with 25 fathoms of stray line, was 11 knots large = 12.83 statute miles per hour.

The fresh water condensers maintained an uniform vacuum of 27½ inches of a mercurial column, and by the aid of an auxiliary distilling vessel, more water was readily obtained than was required to meet the loss by vents and leaks from the boilers, pipes, &c.

With a view to test the evaporative qualities of the boilers, and at the same time to verify the extraordinary results here given, in economy of combustion, the water of condensation therefrom was, at six different periods, measured in a vessel, and the supply was found to reach the unexampled quantity of 9.96 lbs. per pound of anthracite coal consumed, and notwithstanding this unprecedented attainment in a marine engine, it could have been very materially increased with better firing of the furnaces.

In conclusion, it may not be amiss for me to add, that all the elements of means and results here given were noted by myself, so far as it was practicable to do so; and such as I had to transfer to the observation of others, were alone confided to my two assistants, who accompanied me on this occasion for such services.

I am, respectfully, yours, &c.
CHAS. H. HASWELL.

JOHN B. KITCHING, Esq., New-York

PADDLE *vs.* SCREW.

AN experiment of an interesting nature, and attended with important results in connection with steam navigation, has recently been made by the Peninsular and Oriental Steam Company, who, more fully to test the respective merits of the paddle and screw, have altered one of their fine steamers from a paddle-wheel to a screw. The steamer in question is the *Sultan*, an iron ship of 1,200 tons burden, originally fitted with engines of 420 horse power. The alterations now made in the vessel have caused the old machinery to be entirely discarded, and in its place engines of only 210 horse power have been supplied by Messrs. Sunmers and Day, of Southampton, with Lamb and Sunmers' patent flue-boilers. An opportunity was here afforded of exhibiting the difference in speed caused by the alteration not only in the method of propulsion, but in the power of the machinery. The experiment has not only been successful, but the result is sufficiently extraordinary to merit the attention of scientific men. At the official trip of the *Sultan* in 1851, with paddle-wheel engines of 420 horse power, the average speed was 10.71 knots an hour. With the new engines, which are precisely half the power of the old ones, but driving a *screw*, the average speed under steam alone has been 10.47 knots; and with a light breeze, and the fore and aft canvas set, 11.004 knots, the former being very nearly equal to the speed gained when the ship was driven through the water by paddle-wheel engines of such enormously disproportionate force. The slight and almost insignificant difference in speed is not the only advantage gained by the novel change. In place of carrying only

eight days' coal, as heretofore, the *Sultan* can now stow fuel for sixteen days' consumption, has greater accommodation for passengers, and can take 150 to 200 tons more cargo than it was possible to carry before. With this combination of advantages, added to the fact that the wear and tear and working expenses of the ship are proportionately reduced, it is no marve that the experiment has been regarded with much interest, as being one never before attempted. The trial trip to-day was attended by many gentlemen connected with steam navigation, several of the directors of the company, including Mr. J. Allan, the managing director, Admiral Thornton, Admiral Sir Richard Grant, Captain Nairne, R. N., Messrs. De Salis and Hadow, Captain Engledue, Mr. A. Lamb, Mr. Dinnen, the government surveyor, &c. The *Sultan* is heavily rigged, and can spread a great deal of canvas, so as, when necessary, to be entirely independent of steam power. The tests applied to-day have proved the excellence of the machinery, and the admirable handiness of the ship, whether regarded as a full power steamer, or as a vessel embracing the advantages both of a sailing vessel and auxiliary screw. She is to be placed at once on the Southampton, Malta, and Alexandria station.

Southampton, Wednesday, May 2.

ON SCREWS AND SCREW STEAMERS—PROPELLERS ON THE LAKES, AND THE NORTH CAROLINA.

THE journal of the Franklin Institute, for June, contains quotations from the NAUTICAL MAGAZINE, furnishing data respecting the Lake Propellers, International, Buffalo, and Oriental, with remarks from the pen of a valued friend and correspondent.

The journal referred to, although occupying a place on our exchange list, did not come to hand until our pages were full; as a consequence, we have no space for enlargement, and can [illegible]y refer to the subject in such manner as to elicit attention. [illegible]th regard to screw propulsion on the lakes, however desir-

able fuller accounts may be in the consumption of fuel, &c., we have enough to establish the fact, that the screw, as there applied, with the axis above water, and with an equal amount of power, is superior to the submerged screw or the paddle-wheel for speed. As to Captain Whittaker's application, it does not wholly consist in the emerged screw, but also in direct action high-pressure engines, placed upon the gunwale of the vessel, and, we may observe here, that this principle is attracting attention in England. With regard to the wheel of the Iron Witch, designed by Captain Ericsson, it bore no just analogy to that used on the Baltic by Captain Whittaker.

We copy the account of the performance and loss of the steamship North Carolina—the calculations of hull having been already given in vol. 1, p. 337, NAUTICAL MAGAZINE—and, although in her performance there is no just ground of complaint, being much better than was expected, yet we think it might have been still more satisfactory had a larger screw been used. When it was proposed to send her across the Atlantic, we were requested to express an opinion relative to its propriety. We gave that expression in emphatic language, advising by all means that more keel should be added (there being but about four inches below the garboard), and that a propeller of two feet greater diameter, pitch remaining the same, be placed upon the same shaft. This, we think, would have accomplished all that her engineers expected from the new screw with reduced pitch, by furnishing more propelling power. It will be remembered that with the spars and rudder of this vessel we had nothing to do. It will not be a matter of surprise that the back of an iron rudder, scarcely sufficient for, and barely visible at a draught of 10 feet, should be adequate to a draught of 14 feet, without an increase of its vertical size, particularly when under the influence of her sails. With regard to the great amount of displacement, proportionate to the length of the vessel, we have only to say, that large displacement for a given length is no index of a large amount of resistance, and we speak understandingly, when we say, that the North Carolina possessed a smaller amount of absolute resistance, than any vessel of similar principal dimensions and draught of water in the

Old or New World, as is shown by her performance; and, if a duplicate vessel were built, with large screw, and direct action, the truth of our counsel would again be fully sustained.

Notwithstanding all that had been said in reference to her being too full aft, that she would not steer, &c., it was deemed quite consistent with their views of modelling, to trim her one foot by the stern, after having already loaded her three feet above her proper line of flotation, although all vessels, when too full aft, as is well known, repudiate a trim by the stern—as also the propeller, if the model is what it should be. No one more fully appreciates large boilers and fire-surface, and, as a consequence, an economical use of coal, than we do; but the question to be answered is, what is the best application of power? We believe the day is not far distant when an engineer would almost as soon think of reducing the diameter of the paddle-wheel, and then gearing it, as to think of a geared screw of small diameter; and we will go farther and add, that the stern is not the best place to apply the propelling power, neither in wind or steam.

PERFORMANCE OF THE STEAMSHIP NORTH CAROLINA.

The loss of this ship off Holyhead, in consequence of having been run into by the barque Robert, has been reported in the daily journals, but her performance ought to be recorded in order that, taken in connection with the dimensions of her hull and machinery (already given), it may add to our experience in steam navigation. The vessel was originally built for the coasting trade, and specially modelled and designed for light draught of water. She had enormous carrying capacity, was of great breadth compared to her length, and intended as a freighting steamer exclusively.

After two trips to Wilmington, N. C., which she performed well, it was determined to send her to Liverpool for sale or charter. She was accordingly fully decked over between her poop and forecastle, and was dispatched, very deeply loaded (to 14 feet draught), from Philadelphia early in February. It was found, in going down the river, that she steered badly, but this was attributed to improper trim, inasmuch as she had previously steered remarkably well; accordingly she proceeded to sea, encountered extremely severe weather for several days, in which she was found completely unmanageable under sail, and was therefore propelled exclusively by her machinery. At length, when five days out, and off Halifax, the bad ther continuing, and having been strained about her upper works, it deemed advisable to put back, still under her machinery only, when

within 100 miles of the Delaware Breakwater, two blades of her propeller broke off, and she came in with the remaining one. Arrived at Philadelphia, she was taken on the dock, additional keel and a fore-foot put on, her rudder enlarged, her upper works refitted, and the whole hull recaulked, it being found that her hull was as strong as when built; a new propeller was put on (differing from the former in being but 15 feet pitch instead of 16½ feet), and she again departed for her destination, leaving the Breakwater at 1 P.M., March 23d, loaded to 13½ feet aft, 12¼ feet forward. On the passage she encountered some severe weather, but pursued her course without interruption till within six hours run from Holyhead, at 3 A.M., April 8, when run into as before mentioned, just abaft the fore-chains; she sunk in seven minutes, giving the crew barely time to save themselves. Had her voyage been completed, it would have been made, allowing for difference of longitude, in 15 days 9 hours from the Breakwater, which is 3,200 miles run, giving a mean speed of 8½ knots an hour. At her draught, before leaving port, her displacement was 1,195 tons. The consumption of coal averaged 12 tons a day, or 1,120 pounds an hour. Her engine averaged 26 revolutions, or 69⅓ of the propeller per minute, giving 17¼ per cent. slip. Steam averaged 23 pounds, cutting off at half stroke; vacuum 26½ inches.

The boilers made steam as freely on the last day as on the first, and with any head wind (to improve the draught) furnished more than the engine could use. The advantages to be derived from large boiler surface can scarcely be overrated. To this, principally, must be attributed the economy in coal of the North Carolina, which may be stated thus: 1,195 tons displacement, propelled at the rate of 8½ knots an hour (in an average of all weathers) one knot by the consumption of $\frac{1120}{8.5}$=132 pounds of coal. It should not be forgotten, that the true index of capability in steamships is to be found in the number of tons displacement, driven at a given speed over a given space, by the consumption of one pound of coal; and, it appears, by certain recent articles in the English journals, that this practical question is attracting the attention of steam engineers on the other side of the Atlantic.

The great improvements in Cornish engines were brought about by comparison of the "duty" performed; and a similar comparison of ocean steamers would tend to wholesome competition on the part of both shipbuilders and engineers. M.

We are quite satisfied with the performance of the vessel, under the circumstances, being deeply laden, and then *one foot by the stern,* in the face of the general sentiment, that she was *too full aft.* We should be glad to know what the shipbuilder of Philadelphia thinks about her performance, who, when the vessel was half finished, remarked, that "if it were his model, he would sit 'down and cry'—because she was too 'full' aft."

POILLON'S TOPSAIL TRUSS.

We present our readers with a new method of rigging the lower topsail-yard of vessels, having the divided topsail rig, which was first introduced by Capt. R. B. Forbes, of Boston, and recently modified by Capt. Howe, who rigged the yard with a truss to the cap, the yard being sustained in position by a heavy iron brace springing from the topmast heel to the sling band in front of the yard. It will be observed, that the Forbes's rig parrels the yard either to the topmast, or mast-head, as the case may be, below the cap, admitting of hoisting or lowering the yard, as it is designed to have one reef in the lower topsail. The Howe rig, having short mast-heads, contemplates no reef, and the yard is made stationary at the cap. This truss of Messrs. Poillon appears designed as an improvement and substitute for the truss of Captain Howe. We give place to the following letter from the inventors:—

New-York, *June* 18, 1855.

Messrs. Griffiths & Bates:

Gentlemen:—We send you drawings of a new method of attaching lower Topsail Yards for vessels that use double topsails, which possesses many advantages over the different modes now in use, viz.:—

Requiring much less weight of iron work.

Being hung on the topmast and lowermast-head, taking the entire strain off the caps.

The lower band extending to the lowermast-head forms an extra cap, besides giving additional security to the mast-head.

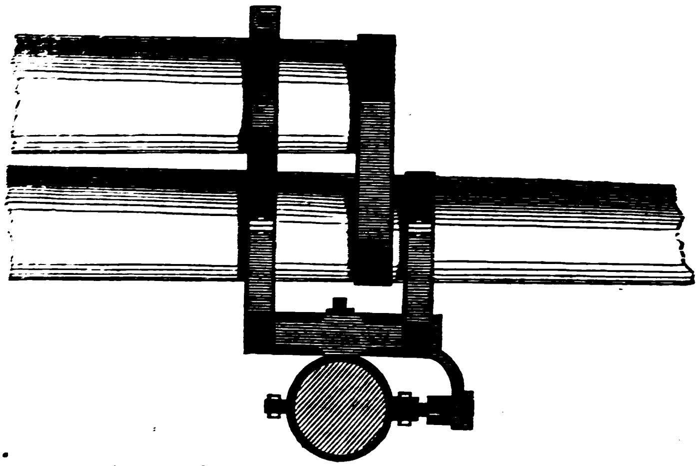
The beautiful clipper ship "Andrew Jackson," of 1,700 tons, now on the berth for San Francisco, has adopted this plan, the iron work for which has been made in a very superior manner by Mr. Sutherland, of Maiden-lane. The weight of one truss for this ship is equal to 715 pounds.

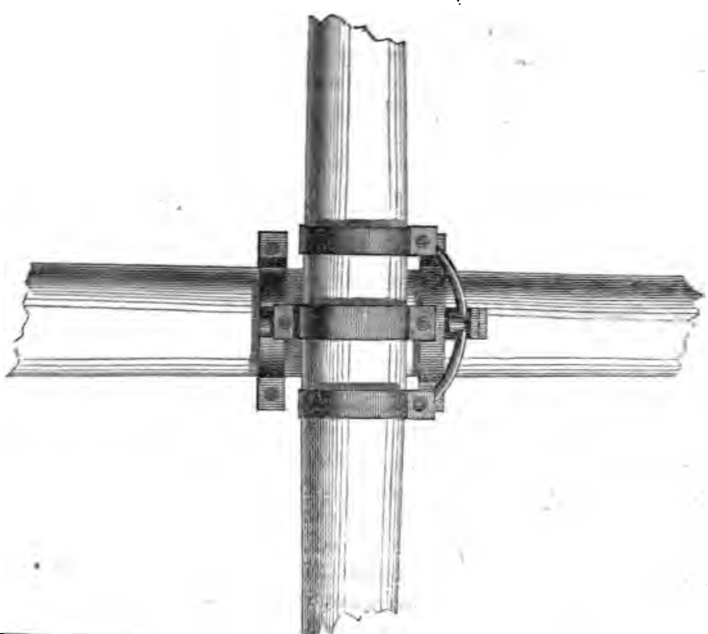
Respectfully,

C. & R. Poillon.

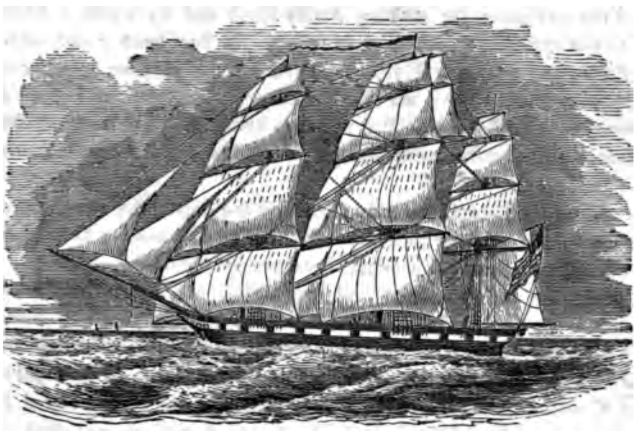
Fog Bells.—There has been a fog bell erected on the north end of Baker's Island, and one also at Race Point, Cape Cod.

The apparatus which rings the bell is wound up, and detained in a wound state by a lever extending into the open air. To the end of this lever is affixed a large sponge, which absorbs the moisture from the fog, and by becoming heavy, settles down the lever, sets the machinery free, and thus rings the bell. A cover prevents absorption of the rain.—*Salem Gazette.*





Nautical Department.



SAILING DIRECTIONS FOR SANDY HOOK.

By M. F. Maury, L.L.D., Lieut. U. S. Navy.

That most excellent scientific Hydrographer, Lieut. Maury, has just completed a full and explicit chart of "Sailing Directions from Sea to Sandy Hook," which has been published separately by authority of Hon. J. C. Dobbin, Secretary of the Navy. Lieut. Maury has adopted the expedient of a colored chart, the better to show the geological formation of the bottom, and the various lights on the coast. The soundings are also given with minuteness and accuracy; and the curved limits of the Gulf Stream, at the various months of the year, are correctly delineated.

A sufficient number of copies of these charts, with accompanying letter-press, have been printed to supply all our marine, and are sold by the Department at the lowest cost which will reimburse the expenditure in getting them printed. We trust every ship or other vessel, having occasion to visit New-York, will be found with one on her master's table, in which case we shall expect to hear no more of such shocking shipwrecks as happened in the case of the ship New Era, and others, last year on the Jersey and Long Island coasts.

We quote entire as follows:—

The better to show what excellent and safe landmarks nature has afforded the navigator for making Sandy Hook and its lights, I have resorted to the expedient of a colored chart. It has been constructed by Lieut. Porter and Professor Flye, who have for the purpose been furnished with the best data extant, which, though not as complete as I could wish, are nevertheless sufficient, in the main, to bring out the most striking of these marks with truthfulness enough to enable one readily to recognize them.

By coloring the bottom instead of shading the depth, the excellent character of the landmarks which are afforded by the *kind* of bottom, when taken in connection with the depth, becomes very striking.

The coast line, the soundings, and the bottom are, on the authorities of the charts of the Coast Survey, entitled *General Chart of the Coast from Gay Head to Cape Henlopen*, published in 1852, and *Preliminary Sketch of Davis's South Shoal and other Dangers*, 1853, *et al.* Where these do not apply, the chart of E. and G. W. Blunt, entitled *The Coast of the United States, Sheet No.* 1, *from Point Judith to Cape Lookout*, 1854, has been consulted. The lights have for their authority the publications of the Lighthouse Board; and the in-shore limits of the Gulf Stream are projected according to data derived from the Wind and Current Charts of this office.

With all the information to be derived from these sources collected together and spread out on a chart before him, the navigator who uses the lead, keeps his run, and pays attention to the water thermometer, will not be in much need of written sailing directions. To such a one the chart itself is sailing directions enough, for it shows that there are no hidden dangers to apprehend—that the leading marks make the way plain—and the log, lead, and look-out will not fail to point them out, and to certify him as to the position of his ship before she nears the land too closely.

As the navigator approaches the western shore of the Atlantic from any port beyond the Gulf Stream, he is or *may be* warned of the fact by the water thermometer. The inner edge of the Gulf Stream is, with rare exceptions, well marked. The eastern, or outer edge is not so well marked. But though the navigator may not be able always to say at what time his vessel entered the stream from the east, yet, when he gets well into it, he will generally have no difficulty in recognizing the fact. Being in it, he should, however good his chronometer and accurate his reckoning may be *supposed* to be, have frequent recourse to the water thermometer, for, by a little attention to it, he may often tell, within a few miles, when he leaves the inner edge of the stream, and enters the cold water between it and the shore.

Being thus put upon his guard, he has in the lead, and the lookout, and the water thermometer, sure guides for conducting his vessel safely thence to the offings of Sandy Hook, and of placing her so near the entrance that

when the fog lifts, or daylight appears, he will be in the fair way to port, and have no difficulty in recognizing his position.

I have traced in black and red, on the accompanying chart of the offings of Sandy Hook, the mean in-shore limits of the Gulf Stream, for the various months, and at different temperatures. Navigators, however, are cautioned not to regard these limits as *fixed* lines, for they are fluctuating. Sometimes they are much nearer to the shore, at others farther from it than they are represented on the chart to be; but the lines there drawn show the average limits of the inner edge, traced with a free hand, from the mean of a great number of observations, which limits are near enough to the actual mean monthly limits to put navigators on their guard, for they should be on the lookout for the inner edge of the stream *always*, and for a considerable distance before they reach the position assigned to it on the chart.

Being warned by the water thermometer and the deep sea lead that he is inside the Gulf Stream, or that he has passed the forty and thirty fathom curve, and is nearing Sandy Hook, the lead should be kept constantly going, especially in the night, or foggy or threatening weather; by referring to the soundings, his rate of sailing, and the chart, the navigator will be certified still more surely as to the position of his vessel—for the approaches are shown on this chart to be so well marked by the kind of bottom, and the depth of water, that nothing but stress of weather or the utmost recklessness should hereafter be regarded either as cause or excuse sufficient for putting a vessel ashore there. She may have lost her reckoning, and the weather may be never so thick, still, the marks underfoot are so plain that she cannot, if her master will try them, get into any danger from the shore without his knowledge.

As one approaches Sandy Hook from seaward, and shoals the water to less than fifty or sixty fathoms, the bottom is either mud, ooze, or sand—that is, these are its chief characteristics. The mud or ooze may be blue, black, or green; or it may be mixed with sand; or the sand may be gray, white, or yellow, and be mixed with shells—broken or whole—or with specks, black or yellow. These colors, shells, and mixtures are disregarded in the construction of the chart. It gives only the predominating character of the bottom, sand and mud being colored as sand; mud and sand, as mud; thus recognizing the *main* features *only*. Sometimes there are well-marked patches of pebbles, gravel, or rocks; in such cases the chart is so delineated as to bring them out also, and to show where they are.

Between the shore and the twelve fathom curve, the *kind* of bottom is not given. This space is left blank, to warn navigators to keep out of it until they be certified by the lights, or other landmarks ashore, as to their position. There is some doubt, also, as to the kind of bottom in the neighborhood of Block Island, and thence towards the Nantucket Shoals, for the authorities do not give the kind of bottom there with sufficient distinctness to make my mind clear upon the subject. But that happens to be not very material to the purpose now in view, for this chart is only intended to illus-

trate the *approaches* to Sandy Hook FROM THE SEA, and it is presumed that no vessel from the sea will get upon the ground represented by this part of the chart without first crossing the Nantucket Shoals, or passing over muddy bottom, or recognizing some of the landmarks alluded to which will certify her as to position. There is a large space between these shoals and Block Island, in which there are no soundings, and in which I have *supposed* the bottom to be sandy, though for aught that the charts consulted show to the contrary, it may be mud.

Though the depth and bottom are given with as much accuracy as the present state of our information will admit, nevertheless a caution is necessary: navigators are not to suppose that the sand and the mud even in other parts of the chart where there is no want of soundings, are separated from each other as distinctly and sharply as the colors for mud and sand would indicate. The soundings, for a considerable extent, are occasionally a mixture of sand and mud, and the change from all mud to all sand is often so gradual, and the dividing line is in some places so jagged and irregular, and at others even uncertain as to place, that it is difficult to say exactly where the mud ends and the sand begins. These dividing lines, therefore, it should be recollected, are not, by any means, as sharp as shore lines, nor are their positions as well determined; for they, like the forty, the thirty, twenty, and the twelve fathom curves, are necessarily drawn somewhat with a free hand.

Therefore, when the navigator, consulting this chart, finds his soundings to change from mud to sand, he is not to infer that he knows *exactly* and to the very spot where he is; but, on the contrary, he should proceed, even in the best certified cases, as though he had reason to doubt as to his position by several miles at least, and continue to feel his way cautiously until the rate at which he is shoaling his water, taken in connection with the course he has been steering, the distance he has run, or the mud-holes or the gullies which connect them, or the pebble or gravel banks which stand both as a beacon and a fender to the Long Island and Jersey shore, or the lights, or the unmistakable landmarks ashore or at the bottom, make assurance doubly sure, and leave him no room to doubt where he is.

The navigator bound into New-York is requested, before he reaches the offings of Sandy Hook, to make himself familiar with this chart and its features; and, that he may do this the more readily, he will perhaps allow me to call his attention to a few more of the striking characteristics, that nature has placed as beacons at the bottom, to warn him of danger, and guide him safely where he would be.

The 40, 30, 20, and 12 FATHOM CURVES.—The 40 fathom curve, coming from the south and, trending along with the Jersey shore pretty well, takes upon reaching the parallel of Sandy Hook, a turn to the eastward, and runs off the chart where the bottom is very uneven.

The 30 fathom curve conforms more nearly with the Jersey and Long Island shore lines in its direction. Starting from the parallel of 39°, it runs

along with the Jersey shore line until it approaches within 15 or 20 miles of the parallel of Sandy Hook. Here it turns to run irregularly with the Long Island shore line until Montauk Point is brought to bear northwest, where, in muddy bottom, it makes a turn east. After running some distance by irregular curves over muddy bottom, it dips down over sandy bottom, to clear the Nantucket Shoals.

From Cape May to Barnegat, the water between the 20 and 12 fathom curves shoals so gradually that the depth is not a very good guide as to the distance from the shore, at least it should not be considered a nearer guide than 10 or 12 miles. Off Barnegat, the 20 fathom curve turns to the westward, gradually approaching the Jersey shore until it strikes that singular range of holes (they are shaded on the chart) which seem to be connected by a gully or channel-way—also shaded on the chart—not so deep as the holes, but deeper than the surrounding water. Here, at the distance of 24 or 25 miles due south from Hog Island inlet, it turns and runs northeast towards Block Island, passing within 6 or 8 miles of Montauk Point, and so on above and beyond Block Island, where it becomes irregular, with sandy bottom all the way.

From Montauk Point, the 12 fathom curve runs along the shore until it gets off Fire Island Inlet; here, making a bight it runs close in with the beach, thence it gradually recedes until it gets 6 or 8 miles off from it. Turning in front of the entrance to Sandy Hook, it sweeps down inside of the light boat, and runs very nearly along with the Jersey shore, which it gradually approaches—except where it makes another bight marked on the chart—until you reach the head of Barnegat Bay, where it is close; it then gradually recedes until you approach Cape May, where it is 10 or 12 miles from the land.

It may be well to call the attention of navigators to these two bights in the 12 fathom curve. They are very close in, one off Fire Island, and the other off Squam Beach—the most famous place for wrecks. Do these two beaches owe their celebrity to this fact? Deep water so close in seems sufficient to explain why more vessels are lost at these particular places than elsewhere along the same shores. It is well, therefore, for the navigator to take warning, and make it a rule to feel cautiously along after getting in 14 fathoms, and *never* to get into *less* than 12, unless he *knows* where he is. The pebbly bottom off the Jersey shore affords warning of the approach to the Squam Beach bight; and the lead, with proper caution, even when the light cannot be seen, will enable any one to keep out of the Fire Island bight.

THE DEEP HOLES.—Lying to the southward and eastward from Sandy Hook are six remarkable holes—shaded on the chart—having in their deepest parts from 10 to 12 fathoms more water than is found immediately around them. Beginning with the outer one—for the one to the south of it, that is surrounded with pebbles, is not connected with it by the gully—and

taking them in order from seaward, comes *first* the "38 fathom hole" of Blunt's chart, with mud in the deepest part surrounded by sand.*

Second and Third (or second and first 37 fathom holes of Blunt's chart); the first named having from 28 to 37 fathoms of sand, the other from 25 to 39 fathoms of blue mud, surrounded by from 18 to 22 fathoms of sand. These two holes are connected by a gully having 26 or 27 fathoms in it, principally sand, with from 20 to 22 fathoms on the edges. This gully, with the two holes, lies northwest and southeast, and is 20 miles long by 2½ broad, the northwest extremity being about 20 miles southeast by south from the light-boat.

Fourth (32 fathom hole of Blunt's chart). Depth from 20 to 32 fathoms —sand or shells, pebbles, and gravel—surrounded by from 16 to 18 fathoms; length, north-northwest, 4 miles; breadth, 1 mile. This is connected by a gully of from 18 to 19 fathoms, with the "first 37 fathom hole," and may be considered as a bight in the 20 fathom curve, reaching up towards Sandy Hook, and coming within about 12 miles southeast of the light-boat.

Fifth and Sixth (21 and 23 fathom holes of Blunt). These two holes appear to be joined together. They lie north and south, and are 7 miles long, by 1½ broad; depth, from 19 to 32 fathoms, muddy bottom, with from 13 to 17 fathoms of sand or sand gravel near the edges. Fifteen fathoms may be carried nearly up to the light-boat. To repeat: this range of holes—with the light-boat at one end, and the 38 fathom hole at the other—is 55 miles long and 14 broad at the outer end, and the inner end only 1 or 2 miles broad. It has in it from 3 to 18 fathoms more water than is to be found on either side of it, and, therefore, in connection with the pebble banks to the southward and westward of them, constitute the best landmarks possible for guiding in the dark and through fogs, safely into 12 or 15 fathoms, and within sight or hail of the light-boat.

Now, studying the peculiarities which mark the series of holes, and which are denoted by the kind of bottom as well as the depth, and observing also the fact that, with barely an exception, all the pebbly patches of note are off the Jersey shore, inside the 30 fathom curve, and to the southward or westward of this range of holes, and noting also the long gravel bed south of Montauk Point, it will be at once obvious to the navigator how well the approaches from the sea to the light-boat are marked. His guides here—log and lead—are better than any landmarks ashore, because landmarks ashore may be hidden in fogs and the dark; but here the navigator has them under foot, and can, by feeling, tell within a very little compass as to his true place.

When the navigator finds his vessel in 20 fathoms, and is still doubtful as to her position, let her always steer north or northeast, NEVER *west* of north. Now, noting the rate at which she shoals her water—for, if she be,

* Sand and mud are represented on the chart as sand; mud and sand, as mud; the *predominating* character giving the color.

off the Jersey shore, she will shoal it slowly, if at all—and recollecting the course she has been steering, the water she has brought along, and the bottom she has had, he will—generally before, but always by the time she gets into 12 fathoms—have no difficulty in judging pretty accurately where she is, no matter how thick the weather may be.

Coming from the Eastward.—To a vessel coming from sea, with Sandy Hook bearing anywhere between N.W. and W.S.W., the Block Island soundings (mud and ooze), in blue on the chart, are an excellent guide. If she gets out of this mud and into sand in less than 40 fathoms, she will probably be somewhere to the north of lat. 40°. But if she have more than 40 fathoms when she gets out of the mud, then she is probably south of that parallel. The course and distance sailed through the mud, the depth and the distance run between the mud and the 30 fathom curve, and then the gravel beds, the 20 fathom curve, &c., will leave but little doubt as to position.

Coming from the Southward and Eastward.—Suppose a vessel to be coming from the southward and eastward, so as to cross the parallel of 40° lat. somewhere between 71° and 73° W. Here, though she may not sound deep enough nor far enough out for the mud, yet supposing she misses also the long gravel bed south of the east end of Long Island, even then, her rate of shoaling from 40 to 30 fathoms, compared with that from 30 to 20, will leave but little doubt as to the bearing of Sandy Hook. But suppose the navigator, when he gets into 20 fathoms from this direction, should still feel in doubt as to his position. In such a case, he must either have passed to the eastward of the shaded holes and their connecting gullies, and be somewhere between them and the Long Island shore, or he must be very much out in his reckoning, and is somewhere between these holes and the Jersey shore. Being in doubt and in 20 fathoms, let him steer N.N.E., and he will, by keeping the lead going, soon find out upon which shore he is. If on the Jersey shore, a N.N.E. course will take him along parallel with it, or divergent from it, and the water will shoal very gradually and slowly, if at all. But if he be on the Long Island shore, the bottom will be steeper. The distance that he carries water between 20 and 12 fathoms will indicate, beyond all doubt, when he is off that shore.

Coming from the Southward.—To a vessel coming from the southward, and crossing the parallel of 39° to the west of 73°, a north course or a course a little to the west of north, according to her distance from the shore, will carry her safely until attention to the lead shall have warned the navigator of her position, either by the pebble patches, or the shaded holes and their connecting channel. Suppose that all these marks escape detection, and leave the navigator still doubting as to his position, and in the dark, there is yet left a last and safe and decisive recourse: being between 12, and 20 fathoms, he has but to steer N.N.E., as vessels coming from S.E. have been recommended to do, and the lead and log together, in connection

with the soundings and bottom, the distance run, and the course steered on soundings, will very soon make all clear.

Should the mariner, notwithstanding all these signs, marks, and beacons, find himself in 12 fathoms, and still be in any doubt as to his position, he should *never* venture into *less* than 12 fathoms, nor allow his ship to get into the space represented by the white band along the shore, until he knows exactly where he is. His only prudent or safe plan in such a case, is to anchor, or to put the head of his vessel off shore and wait until the fog lifts, the pilot boards him, or until he learns, in some way or other, exactly how Sandy Hook bears.

It is scarcely necessary to remind the commanders of steamers and of other vessels from Europe, of the excellent beacons which the Nantucket Shoals and light afford for them, nor of the unerring landmark which the mud from 30 to 40 fathoms, the long gravel bed, &c., make for them. The commanders of steamers coming in and running between the parallels 40° 30′ and 40° 50′, who take care to notice when they first get mud, and when they leave it, and where, and in what water they cross the gravel bed G, will have very little room to doubt as to their longitude.

In approaching Sandy Hook, the variation changes very rapidly, the total change from one part of the chart to another, exceeding a quarter of a point. Vessels may have fallen into difficulty, and possibly been wrecked, by neglecting to allow for this change. The Roman numerals IV, VI, and VIII, show the degrees of westerly variation for the places they represent.

A chart of the whole coast, representing the bottom in colors after this fashion, would be very useful.*

To illustrate the importance of a careful look out, attention to the log and lead, when approaching the land when it cannot readily be seen, it may be well to state here that investigations made in France some years since, showed that of the shipwrecks upon that coast for a term of several years, ninety-five in one hundred occurred in the night or in thick weather. And the statistics of wrecks about Sandy Hook would, I imagine, show that but very few are owing to stress of weather, but nearly all to neglect of the landmarks which it is the object of the chart to bring out. (May 1, 1855.)

* In 1839, I proposed to the National Institute to undertake the collection of materials for a colored chart of the approaches to our coast, and I am now happy to have an opportunity of showing the advantages of it to the navigator as well as to the geologist.

GRAY'S PATENT COMPASSES.

(Patent dated August 28, 1854.)

Mr. J. Gray, of Liverpool, has recently invented a compass, of which he himself entertains a very high opinion; for in a lecture delivered by him, on the 15th of January last, at the Liverpool Polytechnic Institute, after enumerating the various causes of deviation which affect the compasses of ships, he says, "But I hope to see the day when the incubus of public hypothesis will no longer exist, and the apparatus I have invented will be the pioneer to its accomplishment. With this apparatus, all that is required is an observation by night or day, either by the pole star or meridian altitude in the northern region, or the southern cross and altitude in the southern; two positions are merely required, and the adjustment for heeling can be effected when under press of canvas."

"The invention consists," says Mr. Gray, "in so arranging and constructing ships' compasses as to counteract the vibratory action to which they are subject in steamships and other vessels. The compass is suspended within a vessel or bowl, which is held in a state of suspension within another vessel or bowl containing fluid, which I prefer to be of thick varnish, on account of its adhesive and sluggish action, which is beneficial in keeping the inner bowl steady; and I connect the bottom of the inner vessel or bowl with the bottom of the outer vessel or bowl by springs; and I also connect the upper and inner rim with the outer rim by vulcanized India-rubber or other springs, the inner vessel or bowl being kept in a central position by tangential screws, so as to counteract the lateral action, whilst the springs below will regulate the vertical position of the inner bowl in conjunction with the fluid contained in the outer bowl."

Marine Surveyors' Reports.—Our attention has been called to the manner of giving, as well as to the matter contained, in Marine Surveyors' reports. If they are worth anything to underwriters, they are worth everything; and unless they *represent facts*, the Board of Underwriters had better be without them. We know that such descriptions of vessels are sometimes given, as would lead us to believe that the surveyor had never seen the vessel for which he gave a certificate; one such case has recently come under our own observation in this city. No wonder the list of disasters is long and fearful. Do the Lloyds of London recognize such surveys?

NOTICES TO MARINERS.

New Light Houses soon to be Built.—We hear that the Light House Board in Washington are engaged in the preparation of plans and estimates for the construction of the following new Light Houses, some of which (plans, &c.)have already been completed, viz:—

On the coast of Maine, at Petit Menan, Baker's Island, Franklin Island, Portland Breakwater.

On the coast of Massachusetts, Minot's Ledge, Gray Head, Sow and Pigs, Brant Point, Cape Cod.

For numerous small range Lights on Lake Champlain.

On the coast of Rhode Island—Watch Hill, Beaver Tail.

On the coast of New-York—Six range lights in New-York Bay, Great West Bay, L. I., Beacon and Romer Shoal.

New-Jersey—Absecom, (a first class light).

Delaware—Cross Ledge, Ship John Shoal.

Maryland—Seven Foot Knoll.

Virginia—Cherry Stone, Mouth of the Rappahannock.

North Carolina—Wade's Point, Roanoke Marshes, Royal Shoal.

South Carolina—Cape Romain, Castle Pinkney, Fort Sumpter, Battery at Charleston.

Florida—Jupiter Inlet, Coffin's Patches.

Texas—Mouth of the Sabine River.

California—Punta de los Reyes, Point Lobos.

Washington Territory—Cape Flattery, New Dungenness, Blount's Island.

Oregon Territory—Umpqua.

Four Light Vessels—two first class and two second class, building.—

Under the Act of Congress providing for the Buoyage and Stakeage of Mobile Bay, the following Day Beacons have been erected:

Two ranging through Choctaw Pass as formerly, and lighted at night.

One at the site of the "wreck stake;" one at the "upper stake;" one at the "lower stake;" and two others South of these, prolonging the line of channel at Dog River Bar. All these except the range stakes, are to be left on the port hand when coming in.

A Day Beacon has also been placed on the end of the Oyster Bar which runs out Easterly from Cedar Point; one on the West end of the spit at the entrance to Navy Cove; one on the end of the shoals which runs out Westerly from Point Clear; and one on the West end of the small detached shoal South of the other.

Each of these Beacons is composed of several piles driven together in a solid clump. Vessels should take care not to run into them, not only for the beacon's safety, but for their own.

D. Leadbeater, Inspector.

Buoyage of the Queen's Channel, River Thames, England.—The following official information has been received through the Department of State, and is communicated for the benefit of mariners. The changes and removals will be carried into effect on the 1st May next:—

Removals.—The West Pan Sand Buoy will be removed a short distance S. S. E. from its present position, and

The Pan San Knoll Buoy taken away, being then no longer necessary.

Change of Colors.—The West Pan Sand Buoy, the Pan Sand Spit Buoy, the Patch Buoy, and the West Tongue Buoy, from their present colors to Black and White Chequered.

The Wedge Buoy from Red to Black.

By the above alterations, the Buoys on the Northern side of the Queen's Channel will be all Black and White Chequered, and those on its Southern side black.

At the same time, the N. E. Margate Spit Buoy, which is now chequered Black and White, will be painted these colors in vertical stripes.

By order of the Light-House Board.

A Buoy Boat has been placed to mark Chatham Shoals. It is painted white, with an iron day mark, painted red, and has "Chatham Shoals" painted on each side in large letters. She is in five fathoms of water, and vessels should not run inside the Boat.

By order of the Lighthouse Board,

CUXHAVEN, March 23—The Light Ship stationed off Otterndorf, has been driven on shore by the ice.

A letter received by Messrs. Chambers & Heiser, dated Foo-Chow-Foo, Jan. 28th. says:—"The Br. schr. Saracen has lately surveyed the river and entrance, and it is reported that the channel has undergone many changes. The result of the survey will probably ere long be published. Long, heavy ships do not now go inside of the Kin-Pai Pass, (where the Oriental was lost,) but vessels of moderate size approach within about nine miles of the city.

The Light Vessel stationed at Lower Cedar Point, on the Potomac River, having been thoroughly repaired, and fitted with a new lighting apparatus, will resume her station on or about the 26th April.

LIGHT AT POINT BONETA.—A fixed light will be exhibited about the first May, from the tower at Point Boneta, on the Northern side of the entrance to the Bay of San Francisco, California.

The illuminating apparatus is of the second order catadioptric, of the system of Fresnel.

The structure will be a brick tower, surmounted by a lantern.

The light will be about 280 feet above the sea level, and should be seen, in ordinary states of the atmosphere, from an elevation of fifteen feet above the water, at a distance of 23½ nautical or 27 statute miles. The following is the approximate position of the Light-house; Lat. 37° 49′ 10″ N., lon. 122° 30′ 50″ W.

By order of the Light-House Board.

A shipmaster just arrived at Liverpool, writes back to his owners, under date of April 7th:—"I would advise vessels running to this port to keep well to the South; in lat. 43° 38′, from lon. 50° to 48′, I found the water 31°, while the air was 32°." The above is a pretty sure indication of the vicinity of a large quantity of ice.

Mr. James Small, keeper of the Highland Light, Cape Cod, states that the sand bars extend farther from the shore than formerly, and cautions mariners against approaching too near. A brig recently got upon one about 4 miles N. W. from Highland Light. On 5th inst. a ship got on near the same spot, and on 6th, a steamer. They all got off after being exposed several hours. Mr. S. notices many vessels passing along the back of the Cape, having very little water under their keels.

LEWES, DEL., May 12—The old light on the Delaware Breakwater has been replaced by a new flash light, with a Fresnel Lens of the fourth order of 360°, which, for the first time, was lit on Thursday night, and exhibits a beautiful and brilliant appearance, being a white fixed light, varied only by flashes.

A "Daboll's Fog Horn" has been placed near the New-London Light house, west side of entrance to Thames River, Conn. It is worked by machinery, and sounds once a minute, duration of sound about three (3) seconds.

By order of the Lighthouse Board.

South Coast of Ireland—Old Head of Kinsale—Extension of Light.—The Port of Dublin Corporation have given notice that, on and after the evening of the 16th day of April, 1855, the light exhibited from the Lighthouse on the Old Head of Kinsale will be shown further Northerly within Courtmacsherry Bay.

The light will continue to be shown seaward and towards Kinsale Harbor as a Fixed Bright Light. It will be colored Red from a line across the entrance of Courtmacsherry Bay to the line of the Horse Rock; and farther within the Bay, Northward of the line, it will appear of the natural color, a Fixed Bright Light.

Kinsale Old Head Light bears, from the Horse Rock, in Courtmacsherry Bay, S. E. by E., distant 5 miles; from the Black Tom Rock, S. E. ¾ E., distant 4 miles; from the Inner Barrels, East end, S. E. 1 S., 3¼ miles.

Vessels, unless trading in Courtmacsherry Harbor, should not pass into the Bay within the limits of the red color of the light.

The above bearings are magnetic—Var. 28° W.

By order of the Lighthouse Board.

Office of the Board of Health,
Norfolk, May 1, 1855.

Notice is hereby given, that all vessels arriving at this port from any port in the West Indies, or on the Spanish Main, or from any port or place where any malignant or contagious disease shall exist at the time of their sailing from thence, are required to be brought to anchor at the Quarantine Ground, and to remain there until visited by the Health Officer, and his written permission shall be obtained for such vessel to enter the Harbor.

By order of the Board of Health.

A new marine railway has been built at Mauritius, capable of taking up a vessel of 1300 tons, which will be of great service in repairing vessels which may come in in distress. It is worked by steam power. The ship Isaac Newton, of Boston, being the first ship taken up, was admitted free of charge.

Notice is hereby given that the Light on Fort Point, at the entrance of San Francisco Bar, was displayed at sunset on the 31st day of March last.

The Light is a fixed one, of the Fresnel Illuminating Apparatus, of the Fifth Order, and is fifty-two feet above the sea.

The latitude of Fort Point Light is 32 deg. 48 min. 26.06 North, and the longitude is 123 deg. 27 min. 35.18 sec. West.

San Francisco, March 12th, 1855.

We are requested to state that the Eastern Overall Beacon, was not to be lit up after Monday night, (April 17th,) as it was to be replaced by a new one, of which due notice was to be given.

The New-Bedford Mercury states that the Shovelful Light Boat, which was undergoing repairs at Edgartown, would be ready to resume her station off Monomoy Point, in about two weeks.

New Beacons on Florida Reef.—Extract from a letter, dated Key West, March 28, says:

"The new Beacons are being put up on the most prominent Shoals

along the Reef, ten of which are now up, and all the rest will be in their places in the course of a few weeks. I am told they can be seen, in clear weather, from 6 to 10 miles. As soon as they are all completed, Sailing Directions will be published by Lieut. Totten, United States Coast Survey; so that, with a good look-out, I can see no reason why a ship should be run upon the Reef.

"I notice that a portion of the foundations of the new Light-House to be built on Collins's Patches, has arrived here; and I presume the work will be commenced as soon as the Beacon on the Rebecca Shoal is finished."

On or about the 1st of May inst., a change was to be made in the illuminating apparatus at Fort Tompkins' Light-House, New-York, by substituting a Fresnel Lens of the 4th order, illuminating 270° of the horizon, for the reflectors, &c., now in use there.

Also, about the same time, a Fresnel Lens of the 4th order, illuminating 360°, was placed in the Robbins Reef Light-House, New-York.

The Pollock Rip Light-Boat had taken her station on the 4th of March.

Beacon Light at Cleveland, Ohio.—A new illuminating apparatus has been placed in this Beacon, and the Light was exhibited on the evening of the day of the opening of navigation, and every day thereafter, from sunset to sunrise, until the close of navigation.

The light will be produced by a catadioptric apparatus of the 4th order of the system of Fresnel, showing a steady fixed light with a bright flash at intervals of one minute.

The light is fifty feet above the level of the Lake, and should be seen, in ordinary states of the atmosphere, by an observer whose eye is 15 feet above the water, about 13 nautical, or 15 statute miles.

The tower is constructed of cast iron, painted white, and is near the N. W. extremity of the eastern pier.

Beacons and Stakes in Mobile Bay.—Under the act of Congress providing for the Buoyage and Stakeage of Mobile Bay, the following Beacons have been erected:

Two Beacons ranging through Choctaw Pass, as formerly, and lighted at night.

One Beacon at the sight of the 'Wreck Stake.'

One Beacon at the sight of the 'Upper Stake.'

One Beacon at the site of the 'Lower Stake.'

Two Beacons to the south of the above, prolonging the line of channel at Dog River Bar.

All of the foregoing, except the range stakes, are to be left on the port hand when coming in.

A Day Beacon has also been placed on the end of the Oyster Bar which runs out Easterly from Cedar Point.

A Beacon on the West end of the Spit at the entrance to Navy Cove.

A Beacon on the end of the Shoal which runs out westerly from Point Clear, and

A Beacon on the West end of the small detached Shoal south of the last named point.

Each of these Beacons is composed of several piles driven together in a solid clump.

Vessels should take care not to run into them, not only for the Beacon's safety, but for their own.

D. Leadbetter,
L. H. Inspector.

Captain Potter, of the ship Architect, from London, at Hong Kong, March 23, communicates as follows to Messrs. Lyall, Still & Co., agents for Lloyds, at that place:—

"Gentlemen—I beg to inform you that the island of Tristan D'Acunha, in the Southern Atlantic Ocean, seems to be laid down on most charts about 40 miles too far east. Purdy's chart of 1854 has it about lon. 12° 20″ W. of Greenwich, but his chart of 1850 has it in 13° 00′ W. The latter position I found to be correct, or nearly so, by two good chronometers. Horsburgh and Raper appear to be wrong also. And as the island is in the direct route of Australia and China bound ships, it is desirable that its true position should be universally known.

I am, gentlemen, your obedient servant,

GEO. A. POTTER.

SHIP ARCHITECT, HONG KONG, March 29, 1855.

The following extract is from the log-book of the French ship Robuste, kept on her passage from Singapore to China:—

"On the 23d of January, 1855, at 11 A.M., the man on the watch called out 'Breakers a-head,' and a little under our course. By the distance we were from Palawan, for which we were shaping our course, and my latitude estimated, I was expecting to encounter no danger near; and we continued till 11 30 A.M., making two miles to the hour. At that time we altered our course when distant about 100 yards from one of the breakers, the lead giving 30 fathoms; and five minutes after, with 50 fathoms, we had no ground. Those breakers are very dangerous, because though the sea was agitated, sometimes five minutes passed without its showing itself, but when breaking, it was with great force. We saw three, distant about one mile, breaking alternately.

"I suppose there was not more water on them than four or five feet, and am persuaded that in a calm nothing would notify their vicinity, because the sea was not at all broken. The latitude by observation at noon, with three observations, 10° 25′, nearly that of Asia Rock; but it is on the chart 55 miles distant from land, while I was not distant at the utmost 30 miles at the time. The land at the extreme north in sight was E½N., the high mountain of Palawan was S.E.¼S., and the entry of the Bay Oolvongan S. ¼E., distant about 25 to 30 miles.

My chronometer was well regulated, but I have not been able to take an *angle horaire*. On the 19th, I saw the breakers N. E. of Investigator and of Royal Captain, and rounded them very close: and on the 20th I saw the Bombay, and their positions are exact with my observations."

A Sand Bank and Reef, not laid down on the charts, were observed in lat 16° 30′, lon. 149° 40′ E., by Captain J. C. M. Van Stryen, of the Dutch barque De Nyverheid, from Hobart Town for Batavia, which correspond in longitude, though not exactly in latitude, with those seen by Captain Marshall, late of the Ellen, who accounts for the discrepancy by the "strong currents," the bank and reef having been seen by Captain Van Stryen in the morning and by himself at noon. Captain Marshall adds, that such a "sand-bank and reef exists" is certain, and great caution should be observed in running down the northing.

TUCKERNUCK SHOAL AND SLUE BUOYS—VINEYARD SOUND, MASS.—Instead of the Buoy Boats on the end of Tuckernuck Shoal and Tuckernuck Slue, nun buoys have been placed.

The one on the shoal is painted red, with the number 10 upon it, and stands in 20 feet water.

The other is placed on the South end of the slue, and stands in 12 feet of water. It is painted red with the word SLUE upon it in black letters, and must be left on the starboard hand in going into Nantucket.

By order of the Lighthouse Board.

BOSTON, April 27, 1855.

Lieut. Meade, of the schooner Pharos, is at present employed at the Rebecca Shoal, putting up an iron beacon. The beacon will be over 100 feet high, and a conspicuous mark for vessels passing the quicksands.

LIGHT AT POINT BONETA, ENTRANCE TO THE BAY OF SAN FRANCISCO, CAL. —A fixed light will be exhibited about the 1st of May, 1855, from the tower of Point Boneta, on the northern side of the entrance to the Bay of San Francisco, California.

The illuminating apparatus is of the second order catadioptric of the system of Fresnel. The structure will be a brick tower, surmounted by a lantern painted black.

The light will be about 200 feet above the level of the sea, and should be seen in ordinary states of the atmosphere, from an elevation of fifteen feet above the water, at a distance of more than 20 nautical miles,

The following is the approximate position of the lighthouse: lat. 37° 49′ 16″ N., lon. 122° 30′ 50″ W. of Greenwich.

By order of the Lighthouse Board.

SAN FRANCISCO, March 22, 1855.

FORT POINT FIXED LIGHT, ENTRANCE TO SAN FRANCISCO BAY, CAL.— Notice is hereby given, that the light on Fort Point, at the entrance of San Francisco Bay, California, will be displayed at sunset on the 21st day of March, inst., and on each succeeding day, from sunset to sunrise.

The light is a fixed one, of the Fresnel illuminating apparatus of the fifth order, and is fifty-two feet above the level of the sea, giving a range, from an elevation of fifteen feet above the sea, of 12½ nautical miles.

The position of Fort Point, as determined by the Coast Survey, is lat. 37° 48′ 26″ N., lon. 122° 27′ 33″ W. of Greenwich.

SAN FRANCISCO, March 12, 1855.

A Fog Bell, weighing 1,300 pounds, has been placed near the lighthouse at Throgg's Neck, N. Y. It is struck by machinery once in 8½ seconds, or 7 times a minute, and should be heard from one to one and a half miles.

By order of the Lighthouse Board.

NORTH COAST OF SPAIN—FIXED LIGHT ON CAPE LA HIGUERA, FUENTERRABIA.—Official information has been received at this office that the Spanish Government has given notice, that on the 1st of April, 1855, a permanent fixed light will be established on Cape La Higuera, on the western side of the Bay of Fuenterrabia, at the mouth of the Bidassoa, instead of the temporary light for the use of fishing vessels.

The new Light Tower stands in lat. 43° 23½′ N., lon. 1° 47′ W. of Greenwich. The illuminating apparatus is catadioptric or refracting, and of the fifth order.

The Light is fixed, of the natural color, and is exhibited at an elevation of 290 feet above the level of the sea, but being of small power, will not be visible beyond a distance of 7 or 8 miles.

The light is the first or easternmost on the north coast of Spain, nearest the French frontier; the fixed Light of Socoa, and the revolving Light of Biarritz may be in sight at the same time with it; the mariner is, therefore cautioned not to mistake them one for another.

By order of the Lighthouse Board.

LIGHT AT FORT MACON, BEAUFORT HARBOR, N. C.—A fixed light will be exhibited for the first time, on the evening of May 20, 1855, on a tower recently erected about 200 yards behind Fort Macon.

The illuminating apparatus will be a fourth order Fresnel lens, illuminating 270° of the horizon.

The tower is of red brick. The iron lantern and surrounding gallery are also red.

The light will be 50 feet above the mean level of the sea, and from an elevation of 10 feet above the water, will be visible from 12 to 13 nautical miles.

On the same evening, will be exhibited for the first time, a Beacon Light near the beach, one-quarter of a mile from the tower above mentioned, the two lights ranging with the outer buoy of the main bar, bearing S. 49° 45', E. magnetic.

The beacon is built of wood, painted white, 12 feet square at base, and 6 feet square at top.

The beacon light will be 30 feet above the level of the sea, and will be visible in the direction of the bar, about 10 nautical miles. The light will be directed towards the bar, illuminating an arc of 112° 30', on either side of the range line.

The position of Fort Macon flagstaff, as determined by the Coast Survey, is lat. 34° 41′ North lon. 76° 40′ West of Greenwich.

By order of the Lighthouse Board.

WILMINGTON, N. C., April 13, 1855.

LIGHTHOUSE AT BASS RIVER, NORTH SIDE OF VINEYARD SOUND, MASS.—A lighthouse has been erected at Bass river on the north side of Vineyard Sound, and the light will be exhibited for the first time, on the evening of the 1st May next and on each succeeding day, from sunset to sunrise.

The apparatus is of the fifth order, fixed, of the system of Fresnel, illuminating an arc of 180° of the horizon.

The tower is placed on the centre of the keeper's dwelling.

The tower and dwelling are painted white, and the top of the lantern red.

The light will be 40 feet above the mean level of the sea, and should be seen in ordinary states of the atmosphere by an observer 10 feet above the water, a distance of 10½ nautical miles.

The light will be visible from East around by South to West. Vessels approaching from the westward, must bring the light to bear N. by E. to clear the east end of the breakwater; and those approaching from the eastward, should bring the light N. W., before running in for the anchorage.

By order of the Lighthouse Board.

BOSTON, April 25, 1855.

DEVAAR LIGHTHOUSE.—Official information has been received at this office, that the Commissioners of Northern Lighthouses have given notice that a lighthouse has been built upon the Island of Devaar, at the entrance to the Bay of Campbeltown, in the County of Argyll, the light of which will be exhibited on the night of Monday, 12th July, 1854, and every night thereafter, from the going away of daylight in the evening, till the return of daylight in the morning.

The following is the specification of the lighthouse, and the appearance of the light, by Mr. David Stevenson, Engineer of the Commissioners:—

The lighthouse is in N. lat. 55° 25' 45′, and W. lon. 5° 32′ 16″.

The Devaar light will be known to mariners as a revolving light, which shows a bright white light once every half minute.

The light is elevated about 120 feet above the level of high water of ordinary spring-tides, and may be seen at the distance of about 15 nautical

miles, and at lesser distances, according to the state of the atmosphere; to a nearer observer, in favorable circumstances, the light will not wholly disappear between the intervals of the greatest brightness. The arc illuminated by this light extends from about S. ¼ E. by compass, to about by W. by N., and faces northwards.

By order of the Lighthouse Board.

May 10, 1855.

Notice is hereby given, that on the 6th inst., an iron bell-boat was anchored near Alden's Rock, off Portland Harbor, Me., to warn vessels of their proximity to the rocks.

The bell weighs 500 lbs. It will be sounded by the action of the sea; is hung twelve feet above the surface of the water, and can be heard at the distance of about one mile.

The boat is painted black, and on both sides of a frame above her, the words Alden Rock are distinctly painted in white letters. She is anchored about ¼ mile S.E. of the Alden's Rock buoy, in 14 fathoms water.

Cape Elizabeth Eastern Lighthouse bears from her N.W. by W., distant 3 miles; Portland Head Lighthouse bears from her N.N.W. ¼ W., distant 6¼ miles.

The following additional buoys have been placed to mark sundry rocks near the entrance of Portland Harbor:—

Eastern Hue and Cry—Black spar buoy, marked 1.

Bearings—Eastern Cape Elizabeth Lighthouse bears N.W. by N., distant 4 miles.

Alden's Rock buoy N. ½ W., distant 2 miles.

The buoy is 36 feet at low water, is 125 feet E.S.E. of the ledge, which has 16 feet over it at low at water.

Old Anthony Ledge—Spar buoy, red and black horizontal stripes.

Bearings—Eastern Cape Elizabeth Lighthouse bears N. by W. ¾ W., distant 2½ miles.

Wood Island Lighthouse bears W. by S. 2-4 S., distant 9½ miles.

The buoy is in 36 feet at low water, and is about 150 feet south of the ledge, which has 22 feet over it at low water.

Vapor Rock—Spar buoy, red and black horizontal stripes.

Bearings—Eastern Cape Elizabeth Lighthouse N. by W. ½ W., distant 3 miles.

Barn on Richmond's Island N.W. by W. ½ W., distant 3 miles.

The buoy is 100 feet S. of the rock, which has 15 feet over it at low water. Note—To distinguish this buoy from that on the Old Anthony, a horizontal piece of board painted black will be fastened to the top of this buoy.

Taylor's Reef—Black spar buoy marked 3.

Bearings—Eastern Cape Elizabeth Lighthouse N. by. W. ½ W., distant ¾ mile.

Barn on Richmond's Island W. by S. 1½ miles.

The buoy is in 36 feet at low water, and is 150 feet S. S. E. of the ledge, which has 8 feet over it at low water.

Bell Rock—Spar buoy, red and black horizontal stripes.

Bearings—Portland Head Lighthouse N.W. by W., distant 1⅛ miles.

" Eastern Cape Elizabeth Lighthouse, S.W. by S. ½ S., distant 4¾ miles.

The buoy is in 42 feet at low water, and is 150 feet S.E. of the ledge, which has 18 feet over it at low water.

N. B.—In entering a harbor from seaward, black buoys with odd num are to be left on the port hand, red buoys with even numbers are to be

on the starboard hand; buoys with red and black horizontal stripes may be left on either hand.

By order of the Lighthouse Board.

PORTLAND, June 9, 1855.

On the homeward passage from Manilla to New-York, the ship Golden West, Captain Curwen, went ashore on a rock not laid down on any chart. In a letter to his owners, he says:—I left Manilla Feb. 7, and on the 17th, at 2 P.M., passed through the Straits of Gaspar, and at 5 45 P.M. had the misfortune to strike on a coral patch, which is not laid down on my charts, or mentioned in Horsburgh's Directory—and I have the latest editions of both. The last I saw of the Pulo Leat, at 4 40 P.M., it bore N. by E., which is the proper bearing as directed by Horsburgh, who also recommends a S. by W. course to be steered in running out of the Straits; but as I had found some easterly current, I steered S.S.W. after 5 P.M., and yet did not allow enough for current; still, had I made my course not better than S.½E., it would have carried me clear of all dangers laid down—and I made it better than S.½W.

After striking, clewed up everything, as the wind was directly on the shoal; carried a kedge out astern, and endeavored to heave her off—but as the wind and current were setting so strongly on, we brought the kedge home without starting her. I then got out the long-boat and carried out a stream anchor, moved everything on deck from forward, and also as much hemp as we could stow aft without interfering with the work, and made every endeavor to get her off, but without success. It now became evident that we must lighten her.

At 9 A.M., having thrown overboard some three hundred bales of hemp from forward, she worked loose, and at 10 o'clock we had her afloat again, after loosing stream, anchor, and cable. There can be no doubt but that this is something new, as since leaving Manilla I have made several islands, and only eight hours before striking, passed within a mile of Gaspar, and when close to it got two good sets of altitudes, and found *both* chronometers correct to a mile; and when on shoal, and after getting off, got good observations, which placed it in lat. 3° 23′ S., lon. 106° 56′ E. I examined it thoroughly, and found it to be a small patch of not more than sixty yards in extent; shoalest water on it three fathoms, and from that to eight fathoms, and very uneven. A vessel drawing not more than seventeen feet would go over it, as probably many have done, and deep ships have all been fortunate enough to clear it. A vessel might pass within half her length of where we struck, without knowing the danger near, as we saw nothing to indicate it, excepting for the space of about an hour, when an eddy current caused a slight ripple. The nearest danger to it, as laid down on the charts and given by Horsburgh, is Fairlie's Rock, which bears from it S.E. by E., distance 7 miles.

At one time the wind, sea, and current were setting so strong on to the shoal as to bring our anchors home as fast as we carried them out, and I had but little hopes of getting her off again. She lay quite easy, as her bow was driven so firmly on to the rock as to hold her still, her stern all the while in *eight* fathoms water. I am happy to find she is perfectly tight, and, as far as we can see, is uninjured. Yesterday I passed within a mile of "The Two Brothers," and found my chronometers both perfectly correct; and there cannot be a possibility of my having struck on Fairlie's Rock, as there is five miles difference of latitude—i. e. if Fairlie's Rock is laid down correctly. There could be no mistake in my latitude, even if my longitude were not correct; and besides, Fairlie's Rock is described as having but *four feet* on it, while on this shoal there is nothing less than *three fathoms*.

This is certainly a most disagreeable mode of surveying, but I believ

that most of all the shoals in the China and Java Sea have been discovered in the same manner.

IRELAND.—WEST COAST.—BROADHAVEN FIXED LIGHT.—Official information has been received at this office, through the Department of State, that the Port of Dublin Corporation have given notice, that a Light-house has been erected on the west side of the entrance of Broadhaven Harbor Channel, from which a light will be shown on the evening of the 1st day of June next, (1855,) and which from that time will be lighted during every night from sunset to sunrise.

The light will be a fixed light, appearing of the natural color, bright, as seen from between the bearings of S. by E. ¾ E. and N. N. E. ¼ E. (round by the eastward), and of a red color, as seen from the harbor, between N. N. E. ¼ E. and N. E. by E. The focal point is 87 feet over the level of the high water of spring tides; and in clear weather it will be visible seaward at the distance of about 12 miles.

The tower is circular, of stone color, and 50 feet in height from its base to top of dome. It stands on Gubacashel Point, in lat. 54° 16′ N., and long. 9° 53′ W. bearing from Erris Head (rocks north of) S. S. E. ¼ E., distant 4½ nautic miles; from Kid Island, S. W. ½ S., distant 3¾ nautic miles; from Tidal Rock, (in channel, off Coast Guard Station,) N. N. E. ¾ E., distant ¾ nautic mile.

In entering Broadhaven Bay, keep the light open to clear the rocky islets off Erris Head; and in sailing through the Harbor Channel, to clear the tidal rock off Coast Guard station, keep eastward or outside the limits of the red color of the light.

All bearings are magnetic.

By order of the Light-house Board.

May 28, 1855.

BUOYAGE OF THE QUEEN'S CHANNEL, RIVER THAMES, ENGLAND. — Official information has been received at this office through the Department of State, that in accordance with the Notice from the Trinity House, London, dated 1st March last, the West Pan Sand Buoy, chequered black and white, and carrying a staff and globe, has been removed a short distance S. S. E. from its former position, and now lies in 14 feet at low water, spring tides, with the following marks and compass bearings, viz.: The West end of Clevewood, in line with St. Nicholas Easternmost Preventive Station, S. S. E. Ash Church, nearly midway from Reculvers to Sarr Mill, S. ¼ E. Girdler Light-vessel, N. by W. ¼ W. North Pan Sand Buoy, N. by E. Pan Sand Spit Buoy, E. by S. ¾ S. South Knoll Buoy, S. E. by E. ¼ E. West Last Buoy, S. ½ W.

The following alterations have also taken place in accordance with the intention expressed in the said notice of the 1st March, viz.: the Pan Sand Knoll Buoy has been taken away, being no longer necessary. *Change of colors.*—The West Pan Sand Buoy, the Pan Sand Spit Buoy, the Pan Patch Buoy, and the West Tongue Buoy, have been changed from their former color to Black and White, chequered. The Wedge Buoy from Red to Black.

By the above alterations the Buoys on the Northern side of the Queen's Channel are all Black and White, chequered, and those on its Southern side Black. The N. E. Margate Spit Buoy, previously chequered Black and White, has been changed to those colors in vertical stripes.

By order of the Light-house Board.

June 6th, 1855.

IRELAND.—EAST COAST.—DUNDALK FLASHING LIGHT. — Official information has been received at this office, through the Department of State, that the Port of Dublin Corporation have given notice, that a Light-house has been erected within the entrance of Dundalk Harbor Channel, from

which a light will be exhibited on the evening of the 18th day of June next, (1855,) and which henceforth will be lighted during every night from sunset to sunrise.

The light will be a flashing light—that is, a fixed light varied by flashes—giving a flash once in every 15 seconds. Its focal point is 33 feet over the level of the sea at high water; and in clear weather it will be visible at the distance of about 9 miles. To seaward the light will appear of the natural color, bright, between the bearings of W. by N. and N. ½ W., and will be masked or screened in the direction of the Dunany Reefs, between the bearings of N. ½ W. and N. by E. ½ E.; it will be colored red towards the west side of Dundalk Bay, and shown bright towards the Harbor Channel northerly.

The Light-house is borne on screw piles of red color, braced into an open framing below the dwelling, which is of octagonal form, and colored white; over this the light-house has a dome formed top. It stands in latitude 53° 58′ 40″ N. and long. 6° 18′ W. within the entrance of the channel, and bearing from Castle Rocks, (off Cooley Point,) N. W. ¾ W., distant 5½ nautic miles; from Dundalk Patch, (rocky shoal,) N. by W. ¾ W., distant 6¼ nautic miles; from Dunany Reefs, (eastward of Dunany Point,) N. ¼ W., distant 6½ nautic miles.

The channel, formerly northward of the light-house, now runs southward of it, and on passing it outward the course alters. Masters of vessels are cautioned to give the piles a sufficient berth.

All bearings are magnetic.

By order of the Light-house Board.

May 28, 1855.

SPAIN.—WEST COAST.—FIXED LIGHT AT CHIPIONA, GUADALQUIVER.—Official information has been received at this office, that the Spanish government has given notice, that on the 1st May next, (1855,) a fixed light will be exhibited on the Church Tower of the town of Chipiona, on the southern point of the entrance of the river Guadalquiver, in the province of Cadiz, on the west coast of Spain.

The Church Tower stands near the centre of the town, in lat. 36 44 15 N.; long. 6 25 46 W. of Greenwich.

The light is fixed, of the natural color; its focus is at an elevation of 70 feet above the mean level of the sea, and it may be seen at a distance of 8 miles in clear weather.

This light, besides marking the position of that part of the coast of Spain, serves also as a mark for the Salmedina shoal, from the northwest point of which the light bears E. by S. ½ S., distant 1½ miles.

All bearings are magnetic.

By order of the Light-house Board.

April 21, 1855.

BUOY ON OUTER WRECK IN HOOPER'S STRAITS.—A Spar Buoy, 26 feet long, painted black, has been planted to mark a sunken wreck near the entrance of Hooper's Straits, Chesapeake Bay.

The wreck lies N. W. and S. E. about 80 yards in-shore of the buoy, in 2 fathoms water.

The bearings of the buoy are as follows: Two pine trees on Hooper's Island, E. N. E. ½ E. Buoy on upper wreck near the straits, S. E. North end of Hooper's Island, N. ½ W. The buoy must be left on the port hand going in.

By order of the Light-house Board.

Norfolk, Va., May 12, 1855.

Revolving Light on the Morro de San Paolo, Brazil.—Official information has been received at this office, that the Provincial government of Bahia has given notice, that on the 3rd day of May next, (1855,) a Revolving Light will be exhibited on the Morro de San Paolo, Brazil.

The Light-house stands on the summit of the Morro, or hill, at the entrance of the harbor of San Paolo, in lat. 13 21 40 south, long. 38 54 48 west of Greenwich. The tower is 80 feet high, and painted white. The light is revolving, completing a revolution in one minute, and showing a bright light for 15 seconds, followed by an eclipse of 45 seconds. It is dioptric or refracting, and of the first order of Fresnel. It is placed at an elevation of 276 feet above the mean level of the sea, and is visible 20 miles in clear weather. At a less distance than 12 miles the eclipse is not total, but a faint light is seen.

This light must not be mistaken for the Revolving Light of San Antonio at the bar of Bahia, which lies 30 miles to the northeast, and revolves once in four minutes, showing a red, a faint, and a bright light, in succession.

Vessels approaching this part of the coast of Brazil are cautioned not to stand-in to a less depth than 11 fathoms, without a pilot.

By order of the Light-house Board.

Light-houses at Trapani and at Isola di Vulcano, Kingdom of the Two Sicilies.—Official information has been received at this office, through the Department of State, that the Sicilian government has given notice that on and after the evening of the 8th of February, 1855, in place of the old beacon on the Colombaja at Trapani, (lat. 38 1 53 north, and lon. 10 9 54 east of the meridian of Paris,) there would be illuminated a catadioptric fixed light of the fourth order, with flashes every three minutes.

This light is elevated 139 feet above the level of the sea, and has a range of 14 nautical miles.

Also, that on Isola di Vulcano, at Punta del Rosario, (lat. 38 20 north, and lon. 12 34 50 east of the meridian of Paris,) there would be illuminated, on March 8, 1855, a catadioptric light similar to the preceding one.

This light is elevated 458 feet above the level of the sea, and has a range of 14 nautical miles.

By order of the Light-house Board.

May 12, 1855.

Ireland, River Shannon.—Fixed Light on the Beeve's Rock.—Official information has been received at this office, that the port of Dublin Corporation has given notice, that on the 14th of May inst., 1855, a Fixed Light will be established on the Beeve's Rock, in the River Shannon.

The Light tower stands on the southwest side of the Rock, in lat. 52 39 north, and long. 91 18 west of Greenwich, and bears from Foynes Island, (North shore) E. ¾ S., distant 3½ miles, from Herring Rocks (North point) N. N. E. distant ¾ mile, and from Carrig Keal, W. ¾ N. distant 4 miles.

The light will be a Fixed Light, at an elevation of 40 feet above the level of high water at spring tides, and should be visible from the deck of a vessel in clear weather at a distance of from 10 to 12 miles.

It will appear of the natural color, bright, as seen from the South or main channel of the River, between the bearing E. ½ N. and N. W. by W., or over an arc of 140 deg. of the horizon, and colored red towards the passage northward of the Beeve's Rock.

All bearings are magnetic.

By order of the Light-house Board.

May 10, 1855.

DISASTERS AT SEA.

STEAMERS.

Caledonia, (propeller) of N. Y., ashore at Point Judith, June 13.
Golden Age, San Francisco, for Panama, was sunk on rocks near Panama.
Anglo Celt, (tow-boat,) was in collision, May 23, on the Mississippi, and sunk.
Potomska, (propeller,) New-York, for New-Bedford, in collision, and sank schooner Job Chase, June 10.
City of New-York, at Boston, from Philadelphia, in collision with sch. B. E. Berry.
Harp, Cardenas, for New-York, put into Key West, leaking in her top sides.
Ben Franklin, St. Thomas, put into Norfolk, leaking badly.
Nevada, for New-York, returned to New-Orleans, with cylinder-head broken.

SHIPS.

Orbit, Liverpool for Quebec, was lost in the St. Lawrence river, crew saved.
Maria, (whaler,) was seen going in Rio Janeiro, leaky.
Morrison, Hong Kong for San Francisco, put into Manilla, in distress, Feb. 4.
Anna Kimball, for Boston, grounded in coming out of Antwerp.
Lion Belge, in leaving Antwerp came in collision with the Ionian, both lost some spars.
Florida, Philadelphia for Amoy, put into Manilla, March 6, leaky.
Argonaut, at Shanghai, China, had been ashore on the North Bank, early in January.
Torrent, at Shanghai, from Batavia, had been ashore on the North Bank and was much damaged.
Brenda, from Hong-Kong, grounded on the South Bank, and filled.
Sovereign of the Seas, from Hong-Kong, was ashore on the middle ground, above Woosung.
Mermaid, Hong-Kong for California, put into Shanghai, with loss of spars and boats.
Caspian, Boston for New-Orleans, wrecked, May 10th, on the Gingerbread Grounds, Bahamas.
Unknown, was seen dismasted off the coast of Morocco, about 3 hours sail N. of Azimone.
Thomas Watson, at N. Y. from San Francisco, lost head, rails, &c., off Cape Horn.
Empress Eugenie, Liverpool for Quebec, was abandoned lat. 37, lon. 37.
John Rawnel, at Charleston, from Newport, E., lost sails, some spars, &c., and shifted cargo.
S. S. Bishop, at San Francisco, from Philadelphia, cast over part of cargo to save vessel, on Feb. 22.
Howard, for N. Y., was in collision, and lost bowsprit and other spars, &c.
Goodspeed, at anchor in Harbor of Deal, lost anchor and cable, in collision with a ship.
Unknown, 1200 tons, was passed April 23, lat. 44 N., lon. 15 W., waterlogged and abandoned.
Cortes, Havana for Falmouth, E., struck on Florida Reef, May 15.
Unknown, was seen April 28, lat. 44 N., lon. 15 W., abandoned.
Aroondates, New-Orleans for Bordeaux, got ashore on Loggerhead Shoal, May 22.
Herculean, Trapani, (Spain,) in coming into New-York, got aground on Robbin's Reef.
Mountain Wave, at San Francisco, from Boston, off Cape Horn 25 days, stove head, rails, &c.
Adams, Bordeaux for New-Orleans, grounded on Loo Key, not much damaged.
Princess Royal, of Bristol, from U. S., is ashore at Port-Neuf-en, Bas river, St. Lawrence.
Geo. L. Sampson, New-York for San Francisco, was burnt, May 3, lat. 14 N., lon. 35 W., all hands saved.
Howadiji, at Boston, from New-Orleans, struck on Tortugas Shoals, May 27, not damaged.
Lochleven Castle, (Br.,) was ashore on the Bird Rocks, June 6, passengers saved.
Rambler, Calcutta for Boston, put back leaky, with cargo shifted, &c.

BARQUES.

Bolivar, (Norw.,) Boston for St. Stephen, N. B., went ashore near Eastport, in a fog.
Maria, Shanghai to Canton, touched on a rock, lost false keel and forefoot.
Mary Dale, at Rio Janeiro, from Valparaiso, damaged on the rocks in entering, April 14.
Savannah, at New-York, from Havana, lost some spars, cut-water, head-rails, and leaking.
Helen Porter, Cienfuegos for Boston, totally lost near Hatteras light.
Kilby, at New-York, from Matanzas, struck by lightning, May 30, lost spars and rigging.
St. Mary's, San Francisco for Melbourne, put into Hilo, S. I., leaking, lost sails, &c.
Dublin, Cienfuegos for Philadelphia, went ashore, May 25, near Cape Atonio Light House.
Ellen Porter, Trinidad for New-York, was seen, May 23, making for Savannah in distress, leaking badly.
Jenny Pitts, at anchor at Trinidad, Cuba, was run into by a Spanish steamer.
Woodstock, (Br.,) Manzanilla, Cuba, for Cork, totally lost near the Isle of Pines, April 4.
Sarah L. Bryant, at Deal for London, had lost sails, bulwarks, and leaking.
Mary Smith, in returning to Charleston, leaky, grounded, and will be a total wreck.
Shamrock, (Br.,) was abandoned, lat. 26.20, lon. 77 W., leaking unmanageably.

BRIGS.

Horatio, (a slaver.) was abandoned after landing 450 slaves on the Island of Cuba.
Frederick Pearl, at Boston, grounded on South Boston Flats, May 17, and filled.

Ellen Dodge, was seen, May 4, lat. 28.30, lon. 70, dismasted, waterlogged, and abandoned.
Vermont, Savannah for Thomaston, went ashore on Block Island, May 19.
Sarah, (Br.,) New-York for Cienfuegos, wrecked on Phillip's Reef, East Caicos, May 20.
Clinton, at Charleston, from New-York, May 22, lost some spars and sails.
Mars Hill, got ashore while going into Key West, slightly damaged.
Pres. Z. Taylor, Bangor for Providence, got ashore, May 28, on Connecticut Point.
Contest, (Br.,) Halifax for Matanzas, totally lost, May 6, on Colorado's Reef.
Charlotte, Rio Janeiro for New-York, lost all but lower masts, and put into Greenport.
George, at New-York, from St. Jago, sprung fore-top-mast.
Flying Arrow, of Lincolnville, was spoken, with loss of foremast, sails, &c.
Isaac Carver, New-York for Canary Islands, lost part of deck load, sails, &c., March 1.
Unknown was passed March 19, by the Isaac Carver, waterlogged and abandoned.
Versailles, Boston for Havana, lost on Abaco Reef.

SCHOONERS.

J. J. Taylor, Tampa for New-York, put into Key West, May 7, leaky.
Oregon, (British) Porto Rico for Halifax, put into Norfolk, May 16, leaking badly.
Galaxy, Halifax for New-York, was abandoned at sea.
Amelia Starkey, was dismasted, May 9, about 8 miles from the Highlands, N. J.
Bennett, at Boston, from Denneysville, lost part of deck load of lumber, May 20, off Cape Ann.
Stephen H. Townsend, at New-York, from Tarragona, much damaged about the head, May 16.
Charles, Me., for New-Orleans, sprug aleak in Barnstable Bay, and went ashore on Sandy Neck.
Viator, Boston for Philadelphia, struck the Delaware Breakwater, May 19, and leaking badly.
I. R Jones, from Philadelphia, sprung aleak, and was ashore, May 24.
Mary Ann, (British) Halifax for Montreal, went ashore at Miramichi, about May 24.
R. G Whilden, in contact with a brig, May 26, was seen running for Philadelphia.
Pennsylvania, at Portland, from Rondout, lost some spars and sails, May 20.
Susan, at Savannah, from Charleston, lost some spars &c., May 24.
Bustamente, New-York, for San Francisco, put into Talcahuano, with loss of sails, spars, &c.
Arago, was ashore near Charleston, May 21.
Bucentaur, at Baltimore, from Calais, lost part of deck load.
Sylph, New-York, ashore on Gasper Point, below Providence.
Stony Brook Packet, (sloop) Pawtucket for New-York, was capsized in the Seekout Channel.
Monmouth, Providence for Philadelphia, in contact with sloop Chief, June 1.
Wanderer, for San Francisco, dragged her anchor and went ashore at Punta Arenas, Costa Rica, April 1.
Mary Anna, Cohasset for Alexandria, ran on her anchor, and knocked a hole in her bottom.
Ella Simmons, New-York, for Swansboro, N. C., got ashore near that place, at Bogue Inlet, June 2.
Emily Ward, ashore below Quarantine Dock, Staten Island.
Julia St. Georges, N. B. for Boston, was run into by steamer Queen, not much damaged.
Rhode Island, at New-York, from Wilmington, was run into by a schooner and considerably damaged.
Calypso, Washington Navy Yard for New-York, went ashore, June 7, near Tally's Point Bar.
Alfred Barrett, at Providence, from Alexandria, went ashore, June 7, on Block Island.
Virginia, Baltimore for Savannah, went ashore, June 7, 12 miles E. of Cape Fear Bay.
Zach Sabel, Laguayra for Baltimore, put into Charleston, June 8, in distress.
Mary Ann, (Br.) Halifax for Montreal, lost May 22, at Tracadie.
Kensington, St. Thomas for Tabasco, sprung mainmast, and put into Kingston, Jam., May 16.
Canary, for Boston, put into Edgartown, had been ashore at Tarpaulin Cove, June 7, leaking 1000 strokes.
Crimea, (Br.) was wrecked, April 22, on a reef off Grand Turks Island
Ustaloga, for Bath, was totally wrecked on Pond Island Bar, June 10.
Charles Mills, Wilmington, N. C., for New-York, went ashore on Frying Pan Shoal, June 9.
William Henry, Baltimore for Georgetown, D. C., sunk in the Potomac, June 11.
Elizabeth Headley, Matagorda for New-York, put into Key West, June 6, leaking.
Sultana, Bangor for Brighton, put into Portsmouth, June 10, leaking.
Com. Kearney, for Boston, was run into by steam-tug Titan, lost bowsprit, and had bow and stern damaged.
Wakulla, Bangor for Mystic, was in contact with sch. Juniata, June 15, and damaged bow.
Unknown, was seen ashore on Sand Island, below Mobile, June 8.
Mail, Philadelphia for Providence, was run into by sch. F. A. Heath, and lost some of her rail and rigging.
Tremont, Norfolk for Harwich, was run into, June 12, by a schooner, and lost both masts, bowsprit, and leaking.
Juniata, at Boston for Baltimore, was damaged in contact with sch. Wakulla, June 15.
Rainbow, Manititlan for New-York, put into Key West, June 6, had lost sails, &c.

Commercial Department.

THE STEAMBOAT METROPOLIS.

BY ERASTUS W. SMITH, MARINE AND MECHANICAL ENGINEER.

Hull, built by Sneden & Whitlock, Greenpoint, New-York. Engine, by Stillman, Allen & Co. Erastus W. Smith, Engineer.

DIMENSIONS.

	ft.	in.
Length on deck	342	0
Breadth of beam	45	0
" " over all	81	2
Depth of hold	16	0
Length of engine space	60	0
Tonnage, Custom House	2,108	
One vertical beam engine—		
Diameter of cylinder		105½
Length of stroke	12	0
Wheels of iron, diam	41	0
Diam. over paddles	40	0
Length of "	13	0
Depth of "	2	6
Dip of paddles, average load	5	0
Draught of water, average load	10	6
Boilers, four in number, on the guards, two on either side, set back to back; and steam-chimney connected into one smoke-pipe.		
Length of boilers	20	8
Breadth of after boilers	13	3
Height of " " (exclusive of steam chimney)	13	3
Breadth of forward boilers	11	3
Height " " (exclusive of steam chimney)	11	3
Height of steam chimneys	8 and 7	0
Number of furnaces to each boiler	2	
Breadth " in forward boiler	4	9
" " after "	5	9
Length of fire-bars	7	0
Tubes, vertical, of brass, without seam—		
Diameter inside		2⅛
Heating surface in square feet	12,000	
Diameter of smoke chimney	6	0

	ft.	in.
Height above grates...	62	0
Average working pressure in lbs., per square inch.......24		
Average point of cut off from commencement of stroke....	4	6
Average revolutions per minute......................15½		
Speed in miles through the water, per hour........17 8-10		
Description of coal—anthracite; fan-blasts used latter part of passage.		
Contents of bunkers, in tons.........................50		

Hull—Length of keel, half scarf, 325 feet; beam, moulded, 44 ft. 5 in.; floor-timbers and frames, double moulded at keel, 20 in.; sided, 20 in.; at top moulded 8 in.; sided, 16 in.; distance between centres, 24 in. Frame of white oak, live oak, and locust; top timbers locust and cedar. Keel moulded 14 in.; sided, 16 in. Keelsons of white oak, seven in number—centre keelson, 4 feet in depth; outer keelsons, 3 feet each. Engine keelsons of white oak, 6½ feet deep. Paddle-wheel beams of white oak, 20 in. square. Top timbers 8×8 in. extended to state-room deck, 10 feet above main-deck, and 26 feet above floor, capped with oak clamp-timbers in., extending from end to end of boat. Frames strapped diagonal iron bars 4¾×¾ in. on the same plan as the Collins' steamships, one each frame, extending from below turn of bilge to the clamp-timber ping top timbers. One half the bars are counter-sunk flush into the remainder are cross-laid over them at an angle of 90°, and the bilge-keelson, and clamps scribed and fitted over the latter. The riveted at their crossings between the frames, and each one bolted to every frame it crosses, which, together with their being accurately embedded in the wood, gives the fabric great strength and stiffness.

Remarks.—The Metropolis is believed to be the largest steamboat afloat, and the first that has been constructed with the diagonal iron truss-work extending to the state-room deck, which adds probably 200 per cent. to the longitudinal strength of the hull, after cutting out sufficient spaces for the freight, passenger and fire-room gangways—making the usual unsightly "hog-frames" in general use on large steamboats, unnecessary.

To Mr. Sneden belongs the credit of introducing this new and important mode of construction. The model and execution of the work are highly creditable, and will add new laurels to his well-established reputation.

To engineers, and others capable of giving correct judgment, the engine will speak for itself. It will bear comparison with the best specimens of engine-work to be found in this country

or Europe. Notwithstanding its immense size, the steam-chests, side-pipes, throttle-valve pipe, and entire front of engine is turned, planed, and polished in the highest style of the art; and the entire machine exhibits a perfection of execution of which Stillman, Allen & Co. may be justly proud.

The cylinder valves, which are of the usual balance description, are fitted with Allen & Wells' adjustable cut-off, which can be conveniently changed, while the engine is in motion, to suit the varying requirements of speed and economy.

By a peculiar arrangement of the hand-gear, the giant engine is easily worked by hand, ahead or aback, by one man.

The engine-room is fitted with magnificent instruments for denoting to the engineer the pressure of steam, amount of vacuum, temperature of water in the condenser, the rotation and position of the cranks at all times, the number of revolutions made, for a minute, passage, or year; also an indicator, actuated by the pressure within the cylinder, for tracing on paper a diagram illustrative of the internal working of the cylinder and valves; and lastly, a magnificent clock, with 25-inch dial, of silver.

The cylinder is more than one-third larger than that of any other single marine engine in the world, being $1\frac{3}{4}$ in. larger diameter and 3 feet more stroke than any one of the cylinders of the English steamship Arabia, which is $103\frac{1}{2}$ in. diameter, by 9 feet stroke—the next largest in existence.

The extraordinary capacity of the cylinder of the Metropolis will perhaps be appreciated, when it is known that twenty-two invited guests found comfortable seats at a table and *dejeuner*, served by Stillman, Allen & Co., within its iron walls. Colonel Richard Borden, E. K. Collins, Esq., and Capt. Nye of the Pacific, were among the guests. After the table was removed, a horse and top carriage was driven through by Col. Borden and others, the top standing. Then still another novel measure was applied—103 men finding standing-room therein at one time. For size of gallows-frame, see page 227, June Number.

The boilers, in general principles, are the same as those introduced with so much success by Mr. Collins, on his famous steamships. The shape of boiler and internal arrangement is differ-

ent, affording simplicity of construction, and unequalled facility for cleaning and repairing every part.

The engine is fitted with a self-operating stopping apparatus, arranged by Mr. Smith especially for this boat. It will instantly unhook the eccentric, and shut the steam off of the cylinder the moment when, by breakage of any of the parts, the cross-head travels half an inch beyond the stroke prescribed by the cranks. This is believed to be the first application of such an appendage, the importance of which all engineers will appreciate.

The performance of the Metropolis is extraordinary. Her average speed is $1\frac{1}{2}$ miles per hour faster than the average of the Bay and Empire States, the sister steamers of the same line; and her consumption of coal, beating them so greatly, is the same as theirs. The Bay and Empire States are each 317 feet long on deck, 40 feet beam, and draw, with average load, 9 ft. 9 in. water, each having an engine of 76-in. cylinder, by 12 feet stroke, with two flue-boilers of the usual description, using fan-blast under grates, and working a steam-pressure varying from 30 to 45 lbs. to the square inch, according to circumstances. Point of cutting-off, $\frac{1}{2}$ and $\frac{5}{8}$ths of the stroke—the cut-off being unadjustable when the engine is in motion. Wheels, 38 feet diameter.

The distance from New-York to Fall River is 178 miles. The average running time of the Bay and Empire State is 11 hours, consuming on an average 88,000 lbs. of coal. The average running time of the Metropolis is 10 hours, working the first half of the passage with natural draught, with a steam pressure of 20 to 24 lbs., cutting off at from 4 to $4\frac{1}{2}$ feet of the stroke, and consuming about the same amount—88,000 lbs. of coal. She will make the passage in eleven hours with natural draught only, and consume only 68,000 lbs. of coal. Her best speed is not yet known, as she has never been driven up to her maximum performance. On Saturday, June 9th, she went to Fall River in 8 hours 21 minutes, running time. She being 25 feet longer, 5 feet more beam, 550 tons greater burthen, and drawing 9 inches more water, makes the coal she consumes when performing equal speed with the above named boats less than two-thirds the proportionate amount used by them; and

they use no more than other first-class boats of a similar size and speed which have been patterned after them. This result is due, no doubt, to the arrangement of boilers affording comparatively a large amount of fire and grate surface in a condensed form, with less proportionate weight, and ample tubular fire surface of little thickness of metal, compared to the plates of flue iron employed in the construction of the ordinary flue boilers; combined with a cylinder of large capacity, fitted with adjustable expansion gear, and every other approved appliance for getting the most useful effect out of the steam when passing through the cylinder, before it is ejected into the condenser. The large area of the cylinder affords the requisite power with the low steam pressure of 20 to 25 lbs. to the square inch, cut off at one-third or two-fifths of the stroke, which becomes expanded to a pressure *below* that of the atmosphere before the end of the stroke, as illustrated by the annexed indicative diagrams; while in the other boats using the customary small proportion of cylinder to boat, and making up for the want of capacity of cylinder by employing steam of high pressure, cutting off in many instances, beyond half-stroke, the steam exhausted into the condenser at the end of the stroke in 10 to 15 lbs. pressure *above* the atmosphere. The engine of the Metropolis is adapted, when working up to full power, to steam off only 25 lbs. to the square inch; and as cutting off from one-third to three-fifths of the stroke has been found in practice to produce the best commercial results, which is, the best balance of forces and expenses, considering the weight and cost of engine, and required *quantum* of fuel to give the best speed, after leaving proper carrying capacity for freight and passengers; 25 lbs. seems to be about the best working pressure for condensing boat engines, where the engines and boilers have been adapted to it; and moreover, the exterior surfaces of boilers, steam pipes, and cylinders, will radiate much less caloric at the temperature due to 25 lbs. pressure, than will be lost at a temperature due to 45. For stationary engines where the weight is no objection, and the boilers and other radiating surfaces can be thoroughly protected with brick work, steam jackets, &c., a higher initial pressure of steam, and a greater degree of expan-

sion is desirable, and will be attended with proportionate economy.

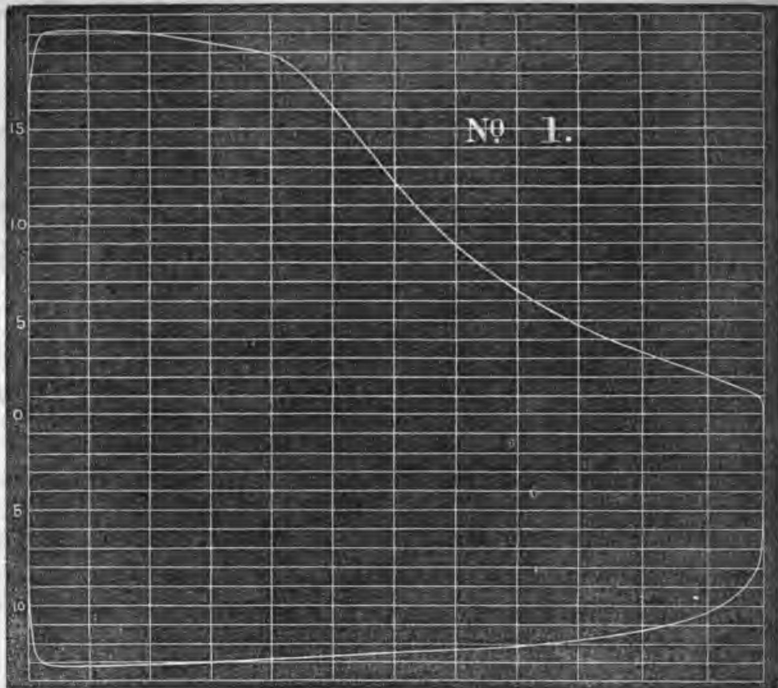
The diagrams, page 370, exhibit the outline and degree of expansion for the Metropolis; No. 1 being for the up stroke of piston, cutting off at 4 feet, and making $15\frac{1}{2}$ revolutions per minute; No. 2 being for the down stroke, cutting off at 3 feet, expanding the steam below the pressure of the atmosphere, and making 15 revolutions.

Which end of cylinder	Upper.
Revolutions per minute	15
Pressure of Steam in boilers, in lbs	22
Position of throttle valve	open.
Vacuum per gage, in inches	$25\frac{1}{2}$
Temperature of hot well, Fahrenheit	125°
Which end of cylinder	Lower.
Revolutions per minute	$15\frac{1}{2}$
Pressure of Steam in boilers, in lbs	22
Position of throttle valve	open.
Vacuum per gage, in inches	$25\frac{1}{2}$
Temperature of hot well, Fahrenheit	125°

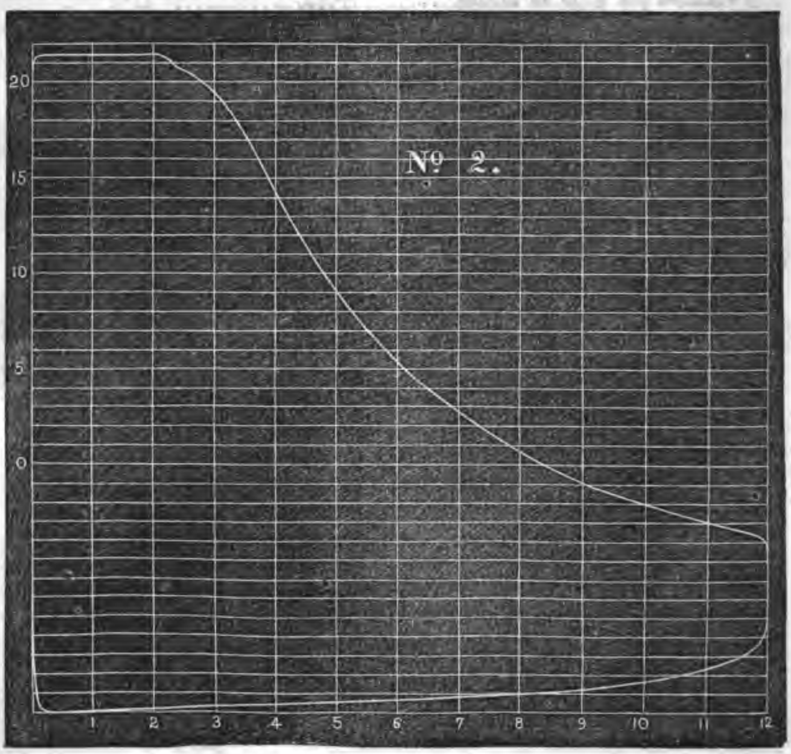
The cabin arrangements differ from those of any other steamer in our waters.

In the body of the boat, between decks, there are 304 berths, in tiers of four on either side, in one unbroken range of about 275 feet. In the ladies' saloon there are 96 berths, in four tiers of three berths, one tier on either side and two in the centre of the saloon, back to back—the great breadth of the boat admitting of this arrangement, which, without crowding, adds 100 per cent. to the berth capacity of the saloon.

On the state-room deck, there are 94 single and double rooms, 13 being furnished with double bed-steads. The furniture and drapery of several of the double-rooms is magnificent. The state-rooms forward and aft the engine are ranged in pairs, athwartships the boat, on either side, and connected by a central door, which admits of two rooms being converted into one, when found agreeable by families or friends. The rooms are entered from the state-room saloon by an alcove, which communicates with the doors of two pair of rooms, and which admits



Nº 1.
15
10
5
0
5
10



Nº 2.
20
15
10
5
0
1
2
3
4
5
6
7
8
9
10
11
12

of the light for each pair being inserted in a pocket, or lantern, by the servant from the outside, greatly decreasing the liability of fire from lights in the hands of passengers.

A toilet room and retiring apartments, on thesa te-room deck, are a new and a very convenient provision for the lady passengers of that deck. There are also gentlemen's retiring apartments, on the opposite side of the boat. The state-room deck is extended to the stem, covering the entire main deck, which is enclosed by bulwarks. The furniture of the state-room and ladies' saloons, is of rosewood, upholstered with moket of various and elegant patterns. The carpets are velvet. The appointments throughout are not only comfortable, but luxurious, and the adornings superb.

The Metropolis is fitted with two of Worthington's steam fire-engines, each capable of throwing three efficient fire jets, and has besides two hand fire-pumps, and a means of converting the boiler force-pumps into fire-pumps; and also an ample provision of fire-hose, buckets, and axes, and carries eight life boats, and one thousand life-preservers. The travelling public are indebted to Col. Richard Borden, President of the Bay State Steamboat Company, for this gigantic and efficient addition to the steam palaces for which this country is deservedly celebrated. He had, besides the enterprise and liberality necessary to produce such a structure, what is *equally* necessary to produce the highest results in any undertaking—confidence in the principal mechanicians he had employed, after giving their plans due consideration.

The Metropolis runs between New-York, Newport, and Fall River, on the Boston route, in connection with the steamers Bay and Empire States.

NOTE.—In his exhibit of the superiority of the performance of the Metropolis, compared with the steamboats Bay and Empire States, Mr. Smith fails to credit the *model* of the former Boat for any improvement whatever in shape upon those of the latter. It is impossible to make just comparisons between the *services* of engines on different boats, without including the amount of *displacement* and *resistance* of hull in our data. Engineers too frequently calculate without the figures of the *Marine Architect*, and some commercial men ignore them altogether. "*Tonnage*" is no index of size, or *displacement*, and "dimensions" give no correct clue to *resistance*.—EDS. NAUT. MAG.

ANALYSIS OF THE BRITISH TONNAGE LAWS.

BY G. MOORSOM, ESQ., OF HER MAJESTY'S CUSTOMS, LONDON.*

IN the preceding article a simple historical view of the British laws concerning the admeasurement of merchant shipping has been briefly presented. The more complex and disputative consideration of the subject will now be entered into, with a view to showing the effects of the operations of these different enactments in regard to influencing the dimensions and forms of the vessels of the merchant navy.

Taking, *seriatum*, the several enactments relating to tonnage, we have first that of the year 1694, for the "admeasuring and marking all and every the keels that carry coals in the port of Newcastle," which was established to protect the public revenue from divers frauds, deceits, and abuses, and to secure the due shipment in these vessels of ten chaldrons of coal of fifty-three hundred cwt. each, consisted in simply loading the vessel to be measured with lead or iron weights, to the extent of the above weight, or twenty-six and a half tons; and then marking by nails at the stern, and midships, the draught of water occasioned thereby. So that in loading these vessels at the staiths with coals, for conveyance to ships in the offing, it was only necessary to bring them down to the line of flotation indicated by the nails, and the exact weight of ten chaldrons, without the possibility of fraud, was secured.

This being a measure of pure and unerring *displacement*, free from the possibility of evasion, and giving the exact dead weight of the cargo shipped, whatever may be the form or construction of the vessel, it offers, therefore, no inducement to the building of one kind of form more than another; and the consequence is, that many of these peculiar vessels are *remarkable for* their sailing capabilities.

Although the process of "admeasuring and marking," to which these vessels are still legally directed to be submitted,

* Member of the late School of Naval Architecture, and Member and Honorary Secretary of the late Commission for the Revision of the Laws of Tonnage.—Treatise on Tonnage, 1853.

involve neither the taking of measurements nor computation, and can therefore, it may be supposed, scarcely be termed a mode of admeasurement, in the usual acceptation of the operation; yet it is, nevertheless, essentially and absolutely the most correct measurement possible of the displacement, or external cubature of that part of the vessel which lies, or is contained between the light and load lines of flotation, that is, of the cargo shipped; and is, therefore, not only an assurance of the security of the public revenue to be derived from the export of the coals, but is found, also, to tend greatly to the general accommodation of the trade in which these vessels are engaged; and from what has been already predicted of their sailing capabilities, the process is, moreover, an eminent and satisfactory, though it may appear a humble example, that an operation founded on truth, *without the possibility of evasion*, is an operation without influence in the production of ill-formed vessels.

Next in succession is the rule enacted in the year 1720, for the prohibition of the importation of foreign brandy and other spirits in vessels of "thirty tons burthen and under, and for the preventing disputes that may arise concerning the admeasurement of them." In this partial act we have the first process of admeasurement in which the taking of defined measurements is established. The rule is set forth as follows: The length of the keel, as much as she treads on, is to be multiplied by the inside midship breadth taken from plank to plank, and the product of the half breadth and the whole being divided by ninety-four, the quotient is "the true contents of the tonnage."

That it was the dead weight tonnage which was here intended to be obtained, appears evident when we consider that the dead weight known to be carried by our small coasting vessels, in which the depth is about half the breadth, agrees very closely, as appears in the example below, with the results given by this rule. Take the example of the coasting sloop *Ann*, usually employed in carrying stones, *whose main inside half breadth is* 6.41 *feet, and depth from upper side of beam to ceiling* 6.37 *feet.* Length of keel, "as she treads on the ground," equal to 35.2 feet, multiplied by main breadth inside, equal to 12.82 feet, multiplied by half main breadth, equal to 6.41 feet, and the produc-

tion of these three factors divided by 94 is equal to 30.8 tons, per tonnage.—The weight of actual cargo usually carried is equal to 31 tons of stone.

The depth and half breadth being practically the same, strongly verifies the inference, that the intention of the law was to express the weight of cargo in tonnage. It also shows, that when the law was framed, the usual depth of vessels was equal to the half breadth. But, being of limited application, this rule had no deleterious influence upon the construction of vessels in general.

Next in chronological order, we find the general, or "Old Law," introduced in the year 1773. This rule will be found to be briefly as follows: The length is to be taken on the rabbet of the keel, from the front of the main stem under the bowsprit, from which, subtracting three-fifths of the main breadth, taken to the outside of the plank of the bottom, the remainder is the length for tonnage, which length, multiplied by the above breadth, and the product by half the breadth, and the whole being divided by ninety-four, the quotient is deemed the true contents of the tonnage.

This rule was similar to its predecessor, except that the measurements were *internal,* and when applied to vessels whose *depths are half their breadths,* the same results are found to accrue from both rules, and these results are equal to the weights of the actual cargoes, found by experience, to be carried by such vessels.

It will at once be observed, by inspecting the rule, that neither any variation in the absolute depth, nor the form of the vessel, both being absent from the formula, can have any influence whatever on the register tonnage; though the least variation in either must, necessarily, have its due effect on the real burthen or capacity.

At the time of the introduction of the "Old Law," *the depths of ships were not far distant from half their breadths*, and the register tonnage represented the weight of the cargo which could be safely carried. Shortly after the establishment of this rule, however, this proportion of depth to breadth was continually increased and carried to the most injurious extent—amounting,

in many instances, to more than three-quarters of the breadth. Of course it followed, that the evasion of dues was in exact ratio to the increase of depth,—so that the tonnage given by the rule bears the same proportion, practically speaking, to the actual tonnage or weight of cargo carried, as the depth assumed by the rule, (namely, half breadth,) bears to the actual depth of the vessel.

Thus, the "Free Trader," length 123 feet on deck, deducting three-fifths of main breadth, (equal to 19-05 feet,) for the length for tonnage, which is equal to 103.95 feet, being multiplied by the main breadth, (equal to 31.75 feet,) and this product multiplied by the main half breadth, (equal to 15.87 feet,) which product divided by 94, gives the result 557.2 tons for tonnage, while the actual cargo carried varies from 850 to 900 tons, the average of which may be taken at 875 tons. From the example of the coasting sloop *Ann*, whose depth agreed with the main half breadth, already given, we may now make a comparison of the utter inaccuracy of the rule in its application to disproportioned vessels. The depth of the "Free Trader," from upper side of beam to outside plank at the rabbet of keel is equal to 25.2 feet, while the half main breadth, which the law assumes to be equal to the foregoing depth, is only equal to 15.87 feet—being a difference of 9.33 feet *between the actual and assumed depth.* It is easy to discover, by a simple proportion, as given above, if we only know the weight which a given vessel really carries, what she would also really carry if her depth were equal only to half her breadth. Example:

Actual depth.		Half breadth.		Actual cargo.		Cargo sought.
25.2 ft.	:	15.87 ft.	::	875 tons	;	x=551 tons.

which is within six tons of the tonnage given by the rule. It would seem, that at the time of framing this "Old Law" rule, the depth of vessels were so uniformly about equal to their half breadths, that the one dimension was substituted for the other. The selection of the divisor 94, in preference to a more convenient factor, must have arisen simply because it was found to bring out, from involution of the principal dimensions as prescribed by the rule, a near approximation to the weight of the

actual cargoes carried at that period by merchant vessels of the usual form.

Having considered the "Old Law" only in its influence on the DEPTH of ships, let us next investigate its operation in influencing the relative proportion of the BREADTH. Suppose a vessel of the form of a rectangular parallelopiped, or oblong box, having a length of 12 feet, a breadth of 19.9 feet, and a depth equal to half the breadth, or 9.95 feet; computing the tonnage by the process of the "Old Law," according to these dimensions, the result will be found .126, or a little more than one-tenth of a ton. Now, suppose the breadth of this oblong box, or vessel, to be diminished by one-half, or to 9.95 feet, then the same process of computation would give a result of 3.17 tons, register tonnage! The absurdity of these results speak for themselves. In the first case the register tonnage is about *one-tenth* of a ton; and in the second, by *diminishing* the breadth one-half, the register tonnage is *increased* to upwards of *three tons.* Or, in other words, an alteration, which ought to have *diminished* the register tonnage one-half, has absolutely *increased* it upwards of two thousand four hundred per cent! Can it be believed that a people claiming pretensions to scientific intelligence—this first maritime nation of the world—can have been subject, for three-quarters of a century, to a law involving such monstrous absurdities?*

We may learn from this analysis, that under any scheme of dimensions whatever, the more the breadth is increased in relation to the length, the more the real capacity is increased in proportion to the increase of the register tonnage, and holds out a premium for an undue increase of breadth.

A single practical example will more clearly illustrate this important injurious property of the system.

Suppose a vessel of principal dimensions according to the usual proportions, as follows:—Length 40 feet, breadth 10 feet, and depth 7 feet. Computing the tonnage by the old rule, we have the result equal to 18 tons; and the true geometrical mea-

* The above remarks apply with equal force to the American people, and to the deleterious and absurd working of the Tonnage Laws of the United States, which are parallel in principle, and very nearly so in form, to the "Old Law" of Great Britain.—ED. NAUT. MAG.

surement in cubic feet is $40 \times 10 - 7 = 2800$ cubic feet. Now let the breadth of this vessel be increased to 11.4 feet, the depth following in proportion, which will give about the proportions of length, breadth, and depth to be found in some of our worst proportioned ships. The registered tonnage will be found to have been increased to 22.92, or nearly 23 tons; and the cubic capacity of the latter dimensions will be $40 \times 11.4 \times 7.98 = 3638.9$ cubic feet.

From these results, we see that by increasing the breadth from 10 feet to 11.4 feet (preserving at the same time the relative proportions between breadth and depth), the register tonnage is increased from 18 to 22.92 tons, or 27 per cent. only; while the real capacity is increased from 2800 cubic feet to 3638.9 cubic feet, or 30 per cent.* Is it, then, to be wondered at that owners, bent on *immediate* and positive gains rather than on prospective advantages, should avail themselves of these legal means to increase the carrying capabilities of their ships, free from any additional taxation? The undue increase of breadth in proportion to length would naturally follow, and as the first analysis showed the influence of the "Old Law" in begetting *deep* ships, so this exposition exhibits the mischievous encouragement it has held forth for the construction of *short* ships.

We will now briefly consider the influence of the "Old Law" in regard to its effects on the forms or models of vessels. If we revert to the computation by the process described in the Rule, we shall perceive that the form or shape of the body is totally disregarded in it, and that, therefore, the most bulky form is en-

* There is still another phase of the law's influence upon dimensions, to which Mr. Moorsom has not adverted, to be seen in its application to the admeasurement of single-decked vessels, where the true depth is taken in the United States. It is this: three-fifths of the *breadth* being taken from the length, to find the "length for tonnage," in every instance, it follows that the *wider* a vessel is in proportion to her length, the less she will ton for registry; because the greater will be the deduction from the actual length on deck. From this it follows, that the adoption of great breadth, in proportion to length, secures a good carrier in proportion to "tonnage," even if she be made quite sharp; but to the builder who works by the "ton" it is not profitable to build very wide vessels—the longer the better for him. Neither does it pay for him to build from 6 to 10 feet of topsides and one more deck than is counted in the register tonnage of those vessels which have more decks than one.—Eds. Naut. Mag.

couraged; inasmuch as, under the same principal dimensions of length and breadth, the register tonnage will remain unaltered, whether the vessel be of the fullest or sharpest and finest model.

Reviewing, then, the results of these various inquiries, it will be observed that the *tendencies* of the "Old Law"* are briefly as follows:

1. To increase unduly the depth of vessels.
2. To decrease their length by increasing their proportionate breadth.
3. To give vessels the fullest form possible.

SHIP-BUILDING IN NEW-BRUNSWICK.

From the St. John *Morning News*, we prepare the following exhibit of shipping on the stocks in the Province of New-Brunswick.

The timber trade is dull, yet American ships share in carrying what little goes forward to England, and depresses freight to the disadvantage of colonial shipping. The ship-building interest is also considered to be dull, nevertheless, a large business is doing. At Courtenay Bay, in the vicinity of St. John, there are six ships in course of construction. Of these, Messrs. W. & R. Wright have on the stocks a ship of 2,500 tons, which will be ready for launching in August. Messrs. John McDonald & Co. are building the next largest ship, 500 tons less in size than the former. Messrs. Wm. Potts & Son have a ship of 1,800 tons, framed. Mr. John Thompson is building a ship of 1,670 tons, to be launched in June. At the yard of Messrs. Nevins & Milledge, a 600 ton ship, is being built. At the yard of Mr. Sulis & Son, in Lower Cove, a ship of the same size will be ready for launching in August. Mr. John Fisher, Lower Cove, has recently commenced a ship of 1,000 tons; he does not expect to launch this year.

In Carleton there are six ship-yards in operation. William Olive, Esq., is building a ship of 1,800 tons. Near Sand Point is the yard of Messrs. Stackhouse & McLauchlin; the ship which they have at present in course of construction measures 1,800 tons. Mr. Thomas McLeod is building a ship 1,050 tons. In the building-yard of Messrs. Ring & Jewett, operations have recently been recommenced on a ship of 1,000 tons. A ship of 700 tons is being constructed in the building-yard of Mr. John Mahony. In

* Very similar to our present law.—Eds. Naut. Mag.

the yard, formerly occupied by Messrs. Stackhouse & Thompson, there is a small brig of 250 tons in course of construction, by a company.

There are at present five ships building at the Straight Shore, Parish of Portland, and another about to be commenced by John Haws, Esq., of 1,200 tons. F. Ruddock & Brothers intend launching a ship of 1,600 tons early in the month of July. A ship of 1,500 tons will be launched from the yard of Messrs. Brown & Anderson, near Portland Bridge, in June. Adjoining Mr. Ruddock's is the yard of Mr. F. Smith; the ship which measures 1,100 tons, is to be launched in June. Mr. Thomas McWilliams is building a ship of 1,250 tons. The yard, formerly occupied by Messrs. Storms & King, has been engaged for three months, by Mr. Douglas, on behalf of a company of men, who are building a brig of 250 tons, to launch in July.

In the 19 yards that the foregoing statement embraces, there will be according to reckoning, an aggregate of 724 workmen; and if we include three or four other yards, about which we have not been able to ascertain particulars, the number will probably reach 800. Of the latter to which we allude, two ships are being built at the Kennebeccasis Bay, about three miles from the city; one of these of 1,200 tons, by Mr. John White; and another of 1,100 tons, by Mr. James Johnson. Mr. Sime is building a ship of 800 tons, at Indian Town; and there is also one of 1,200 tons in course of construction on the east side of Courtenay Bay.

We have thus given a general view of the ship-building interest in St. John and vicinity at the present time. Many of the builders are uncertain as to the time of launching; this will depend in a great measure on the prospects and the probability of their realizing an advantageous market in England. The wages generally range from 4 to 6 shillings, the average being about one dollar per day.

At Miramichi, there are six ships building; the builders, and measurement, we give as follows:—Mr. J. Haws & Co., 1,200 tons; Mr. Burchill, 1,000 tons; and also another of 800 tons; Mr. Richardson, 800 tons; Mr. John Powers, 1,000 tons; Phillips & Co., 400 tons. There are four ships being built at the Bend of Petitcodiac—Messsrs. Salter, Harris, Cochran, T. Carson & Co., are each building a ship of 1,000 tons. At Quaco, there are five ships, three of which are of 1,200 tons; the builders are Messrs. Bradshaw, Moran, and Carson; the remaining two are of 1,000 tons each, and the builders are Messrs. D. & T. Vaughn, and C. Carson & Co. There are three ships building at Sackville—one by Mr. Boltenhouse, of 1,200, another by Charles Dickson, of 1,000, and the other, of 700 tons, by S. Bazely. At Hillsborough, Mr. Betts is building a ship of 1,000 tons. At Kingston, Richibucto, there are three ships building, each of 1,000 tons; the builders are Messrs. J. & T. Jardine, J. W. Holderness, and J. Mehean. [illegible]on, Kennebeccasis, Messrs. Wetmore & Frazer are building a ship [illegible]00 tons. The ship Madras, by these builders, made the run from [illegible]ec to Liverpool in less than 17 days. At the same place, Mr. W. P.

Flewelling recently launched the E. Kaye, of nearly 1,200 tons. In Charlotte County there are two ships building—one at Didgeguash, by H. E. Seeley, of 500 tons, the other at St. Andrews, by Messrs. Dimock & Wilson, of 1,000 tons. There is also a vessel of smaller size building at Oromocto. Exclusive of the City of St. John, this will make 32 vessels in course of construction in other parts of the Province. This will make the total number of vessels building in the Province, 55; of this number 23 may be set down to St. John and vicinity. All the vessels that we have enumerated are under the supervision of Mr. Tucker, Lloyd's Agent.

The wages, we believe, throughout the Province, are somewhat less than in St. John, and the number of workmen at a probable conjecture would in all reach 1,500. Some of the vessels that we have named are building, under contract, but most of them are intended for sale, and nearly all will be ready for launching previous to winter. Those that are building at St. John are under special survey, and intended to class for 7 years, and such as are not under special survey, are visited three times by the Inspector prior to being launched—some of those of the latter description are intended to class for 4 years.

ENGINEERS' TRIAL TRIP OF THE STEAMER OCEAN BIRD.

We have already taken the occasion to call attention to this vessel under the cognomen of "The Six-Day Steamer," in the March number of the preceding volume, and promised a detailed description of construction and particulars of design in the present volume. We have not space to give these particulars in the present number, and will only furnish an account of her performance upon her first Engineers' trial trip, to test the machinery. A second trial trip is expected to come off soon, when her *speed* will be the object of an especial test, the particulars of which we shall chronicle in our next issue.

It may not be improper to recapitulate briefly the history of the *Ocean Bird.* About two years ago the project of establishing a line of European steamers from this port, to make the passage across the Atlantic to Galway within one week (7 days) was proposed by Mr. Wm. Norris, an eminent engineer of Philadelphia, who began the enterprise by the construction of this steamer, to test the practicability of the plan. Mr. John W. Griffiths, Marine Architect, of New-York, now the senior Editor of *The Nautical Magazine,* was contracted with to build a steamship of the least possible tonnage capable of attaining an average speed of 16½ nautical miles per hour, to accommodate 60 to 80 passengers, and carry coal enough for 3,000 miles steaming, and at a cost not exceeding $120,000. To make the

passage in *six days* would require a speed of $18\frac{3}{4}$ miles, a feat which Mr. Norris felt confident she could accomplish, and upon giving his opinion to the world, the *Ocean Bird* was denominated "*The Six-day Steamer.*" Mr. Griffiths' plans were approved, and the vessel progressed nearly to completion, when the unfortunate failure of Mr. Norris brought her under the hammer of the Marshal, and she was purchased by Capt. John Graham, her present owner.

Capt. Graham has had a third deck, with a fourth for the greater part of her length amidships, added to her, above the original design, in all weighing 194 tons, and adapting her to the carriage of 250 cabin, and an indefinite number of steerage passengers. The boiler capacity has been reduced, and the diameter of wheels diminished from their original proportions, and two feet has been added to her draught of water by these modifications. Notwithstanding all these drawbacks upon the original design, it will be seen that the *Ocean Bird* on this very trip to test her machinery, has accomplished a speed not hitherto thought by some minds to be attainable by an ocean steamer, demonstrating that with fair play under her original design, it would have been no task to have crossed the ocean in from 6 to 7 days. She will now do it in less than 8 days, in average weather.

Her dimensions, as completed, are 222 feet on the load line, 225 feet on deck, 36 feet ten inches beam, and 22 feet hold, or 7 feet deeper than her hull was designed for.

The machinery is proportioned as follows :

Diameter of cylinder	65 inches.
Stroke of piston	12 feet.
Diameter of wheels	33 feet.
Length of bucket	7 ft. 9 in.
Breadth of bucket	22 inches.
Number of buckets	28
Dip of bucket	4 ft. 8 in.

She is furnished with four single-return flue boilers, two forward and two aft. Both of the forward boilers are 20 feet long, and the after two 22 feet in length. Width of boilers 9 feet 7 inches, and 10 feet 2 inches in height. The entire fire surface is=4,500 superficial feet.

It will be seen that the *Ocean Bird* is a small vessel, and is not furnished with an extraordinary amount of power, when her shape is considered, being sharper than any sea steamer yet built, and therefore requiring a maximum of power in order to profit by the qualities of the model.

On the first trial of the machinery of a steamer the engine is never driven to its highest velocity, being liable to injury from

too great friction and vibration, until all the parts become smooth and firmly adjusted. The throttle valve was but half opened, and the revolutions were not permitted to go beyond 17 per minute, with 23 pounds of steam, vacuum 24 inches. Draught of water 9 feet 3 inches. The time made under these circumstances was 17 miles per hour, against the wind and tide. We await the second trial for developing her full capacity for speed, before giving further particulars in this respect. Meanwhile, it may not prove unprofitable to submit a few remarks upon the designs of Ocean Steamers.

The day has arrived, when, in consequence of improvements in sailing ships, steamers have in some part lost their reputation for profit, according to the anticipation of commercial men. The reason why ocean steamers have not been so profitable as was expected, is because of their being too slow; they are actually duller and slower than some of our clipper ships; how can it be otherwise than unprofitable? The merchant seeks the cause, and is pointed to the expenses of running a steamer, contrasted with those of running a clipper ship; and without considering that it was to obtain an increased amount of service, which he does not get, that he incurred this extra expense, he at once commences a crusade against the extravagance of the boilers in their consumption of coal, as though economy in the use of coal would increase the steam, and obtain more service from the vessel, and prove to be the grand palladium of success. We are glad to know that there are some exceptions to the general rule, which admonishes us that nearly all the efforts to economize in the use of coal have been at the expense of steam. The best way to save coal is to have a good *model*, and enough boiler and fire surface. No merchant would object to increased rents if his business increased in a like ratio. Just so with ocean travel; the coal is a small item if the speed be obtained; and if a small ocean steamer like the *Ocean Bird* can cross the Atlantic within the week, and make money, why may not one five times as large do it in less time, and be more profitable? How idle to assume that ocean steamships require from 10 to 16 days to cross the Atlantic, while sailing ships make the run in 12 to 20. Better sell the engines and boilers for old iron, and make sail without them, if this is the best steam can do. The idea is too fogy-istic to be entertained by business men. Our embarcation in the construction of ocean steamers on this side of the Atlantic was commenced in Wall-street, on the basis that *power could drive a box across the Atlantic* (we remember the words used as distinctly as though it were yesterday). This idea has been partially carried out, with this modification, that we continue to clip off the corners of the box, by permission;

unfortunately, Wall-street models, like "hot air engines," are "unprofitable." The chief difficulty merchants have to encounter when building ocean steamers, is found in themselves—*they know so much*, they know all about it, or think they do, and follow out in practice that of which they are so confident is right, and still they see their best efforts produce an average of only 12½ miles per hour, while sailing ships have averaged 14; and the highest ocean speed yet obtained by steamers is 16 miles, while sailing vessels have made 18 miles. We do not hesitate to say, that an ocean steamer which cannot surpass a sailing ship in speed *at least one-third*, is not worthy of an engine; and it would be more profitable to keep it out. The *Ocean Bird* can do this now in all weathers, notwithstanding she is loaded with two extra decks, and crippled in power, and has not been completed in conformity to the principles of life boat construction after the manner we intended she should be. She differs from all other ocean steamers which have yet been built in the following particulars: First, her shape is adapted to the service for which she was intended. Second, her power could have been used in all weather, consequently there was no waste of power—in other words, she could not be said to carry an unnecessary weight of engine, which could not be used when most needed, simply because the shape and strength of the vessel would not bear it, as is the case with nearly all of our ocean steamers. The mistaken notion prevails, that if the shape be good, the power may be reduced, and a partial failure is the result; the vessel had better been under canvas; her engines are adapted to a fuller vessel, having proved to be as powerful as the full vessel could bear in rough weather. The best and most powerful engines should go with the best models, and why? Simply because the best model, like all other models, has an *exponent of capacity and a coefficient of resistance*, and these act harmoniously to determine the power necessary to keep the vessel up to her adapted speed; in other words, the coefficient of resistance, by an inverse application, indicates the exponent of power, which should always be regarded as the measure by which the vessel is to be brought up to a speed adapted to her superior shape. The measure of power for the *Ocean Bird*, as we determined it, was a 72 inch cylinder, with 12 feet stroke, and 36 feet diameter of wheel; but we were overruled by the engineers, and the size of the cylinder was reduced to 65 inches. Fortunately, time has enabled us to prove by the vessel herself that we were right. Who that is competent to judge, cannot see, that if she can run 17 miles per hour against wind and tide with 17 revolutions of the wheel, and valve only half open, that, as she is the fastest, she would have been the most valuable vessel in this country, size and cost considered, and there-

fore *the most profitable,* as our figures will show. If she be now the fastest ocean steamer afloat, which she undoubtedly is, what had we not a right to expect, if finished as designed? Whatever speed a vessel is adapted to, should be obtained, and the vessel should be strong enough to bear it in the roughest weather. A vessel (if a good model) is easier and more comfortable when brought up to her speed; and if it will pay to carry passengers by *steam,* it will pay better to carry them in *steam time.*

The following estimate will serve to show the grounds upon which the construction of this vessel was expected to be a profitable investment.

Estimated receipts and expenses based upon 12 round voyages per annum, the ship possessing accommodations, as originally designed, for 60 first-class passengers:

Insurance on two-thirds value, say $150,000	$6,000
Repairs of hull and machinery	30,000
Depreciation at 10 per cent	15,000
Officers and crew, with provisions	50,000
Interest on capital,	10,500
Coal	75,000
Cabin table, and contingents	10,000
Agents, commissions, and salaries	12,000
Rent of docks	10,500
	$219,000
RECEIPTS.	
Sixty passengers at $200 each way	$288,000
1,000,000 letters per annum at 3 cents each	30,000
Bullion and express freight	30,000
	$348,000

We are at a loss to know what profit a capitalist would expect, if the above would not be satisfactory. We have shown what the cost of the *Ocean Bird* would have been, and the service she would have performed, if we had been allowed to finish her according to our own plans.

In conclusion, we say that we hold ourselves in readiness to contract to build a steamer on the life-boat principle, which shall be able to cross the Atlantic ocean from New-York, within the week, accidents to machinery only excepted, carrying 120 first-class passengers, for $250,000, $50,000 of which shall be forfeited if the vessel does not perform as agreed upon; and the vessel be ready for service within one year of the date of the contract. Or, to build a war steamer of a capacity sufficient for coal, armament, stores, and men, armed with 4 12 to 14-inch pivot guns, draw 10 ft. water, and run 18 nautical miles per hour, at a corresponding price, and forfeit for non-performance.

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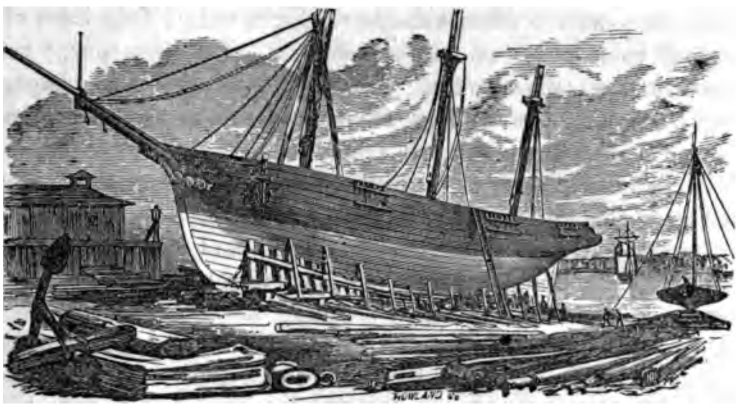
Mechanical Department.



LIMITATION OF KNOWLEDGE IN SHIP-BUILDING.

We sometimes hear it asserted that it is unwise to give publicity to the result of our labors; that knowledge is power, and consequently, to a certain extent, knowledge is wealth. We readily admit the latter as a truism; but doubt the truth of the former proposition, not only because it is at variance with our own experience, but with the history of the world. Knowledge is not to be regarded as an article of trade, which may be bought up and withdrawn from the market, and held for speculative purposes. *The earth brings forth its fruit in their season;*

but *the season for mind* to *bring forth* is *ever the present*, and by withholding what we may have, we dam up the irrigating stream of thought, which flows from mind to mind, through the communication of what we may have taught others, and in turn we are alike benefited by what they may have communicated.

We are not of the number of those who think that this is so much lost, given, or thrown away; quite to the contrary; we should as soon think of ruining ourselves, by advertising our business, as to indulge in that narrow-minded prejudice which confines a man to his own thoughts, which, like the insensible perspiration surrounding him, will bring disease if not thrown off. We have published some truths to the world upon the science of building ships; and what is the consequence? Why just this—we are wiser, and so are our readers; they have obtained value received, and so have we. But, says one, "you have told all the secrets." Have we, indeed? Well, suppose we have, we have learned others, and are now telling them; and when we have told all these, we expect to have learned more, and shall most assuredly publish them too; and so long as we exchange old secrets for new and more valuable ones, wherein have we or our readers lost? and wherein has the ship-builders and engineers of the world lost? If other sciences are progressive, why should not ship-building be? Does it follow that because a man has built one hundred ships from his own models, and has neither shown his models, or seen others, that he is a better builder or modeller of vessels than the man who has built but one, who, before building that one, has exchanged views with his neighbors? We would rather have the one-ship man to build for us, if we were to own the vessel, than the one hundred ship-builder, other things being equal. The more ships a man builds, in an isolated position, the less he improves—and why? Because he is chaining himself to a familiarized shape, and what he does is from intuition and habit, without philosophy, and he cannot help it. We are far from blaming either ship-builders or engineers, (for these remarks apply to both classes). We have no selfish motive in these remarks; we have enough, and more than enough of ves-

sels for the NAUTICAL MAGAZINE, and if we should chance to get short, our daily practice will readily furnish more. Let not ship-builders suppose that we are wholly dependent on themselves for models; this is a great error. If every builder were to place his models and tables in his iron chest, we would not be in the least nonplussed. While ships continue to be built, there will be enough drafts to supply every page of the NAUTICAL MAGAZINE, with an engraving of a vessel if it were necessary. We are not, however, disposed to confine our illustrations to ships, whether by sail or steam, nor yet to the principal cities of the New or Old World. Every mechanic, or an aspirant to that honorable position in society, though he be a minor, may expect even-handed justice from the pages of this journal; and we have only to say, that if ship-builders or engineers would be known to the world, let them show what they have done, in the NAUTICAL MAGAZINE, which teaches that nothing has been done but that may be improved, and that ship-building is but in its infancy.

The time will come when builders will not assume that the favor is conferred upon the editors, but upon themselves, and seek to be thus brought into the currents of commerce, by the power of the press. And we may as well lay off some work for the next ten or twenty years, now, before the close of the first year of our brief existence. Vessels must be built with a greater amount of capacity, for a given amount of resistance and propulsory power. The amount of practical stability must be increased on all classes of vessels, until *sea-sickness*, that bane of ocean travel, shall be reduced to a moiety, and only disturb the *bile-burdened tenant* of humanity. The paddle-wheel now in use must be superseded by a more direct application of propulsory power. A more perfect distribution of canvas upon sailing vessels, having only commenced, must continue; and the strength and safety of all vessels must be vastly increased, until human life and property shall be used, rather than *wasted*, on the engulphing deep.

RULES FOR THE INSPECTION AND MEASUREMENT OF TIMBER FOR THE NAVY OF THE U. S.

PREPARED BY JAMES JARVIS OF NORFOLK, AND ADOPTED 1848.

Live Oak.—All frame or other timber cut to moulds, or got out by diagrams, must be six inches longer at each end than the moulds, or diagrams; and two inches larger each way than the net siding and moulding. The moulds and bevellings are to be applied to each piece by the Inspector.

Keelson pieces may be got out in pairs, or two pieces in one, with an allowance of two inches the siding way, and *six* inches the moulding way. The allowance of six inches in the moulding size is for the purpose of taking out the pith or centre of the tree. They may have a fair curve of from 10 to 14 inches one way, but they must be lined straight the siding way. Or they may be got in single pieces, with the centre or pith taken out before offered for inspection. In all cases to be the dimensions called for in the contract.

Beams are to be got to sharp corners, one foot longer, and two inches larger in the siding and moulding, than the net dimensions. No lap or scarph to be cut by the contractor.

Knees are to be got by the directions and proportions of white oak knees, and measured by the inch as white oak knees are measured. See the table for White Oak knees.

Promiscuous timber must be sided straight to the siding size named in the contract. No wood is to be taken from this kind of timber the moulding way.

Live oak must be clear of rot, splits, ring, and other shakes, worm or ant holes, and all other defects which may appear. All sap-wood to be excluded from the measurement, except in knees. All live oak to be measured by the cubic foot, except knees.

White Oak.—*Keel pieces* must be got to sharp corners, (right angles,) and be two feet longer and two inches larger on each side, as squared, than the net dimensions; this allowance will secure the pieces from all sap-wood, which would be injurious. The fore and after pieces must be dug up by the roots; the butt and top ends to be *sawed off* to sound and perfect wood before offered for inspection.

Rudder stocks must be dug up by the roots, and got two feet longer and two inches larger, the siding and moulding way, than the net dimensions. They are to be got to the *form* prescribed in the contract; both ends are to be sawed off square to sound and perfect wood.

Plank stocks.—One-half the quantity required by contract, or open purchase, must be *forty-three* feet in length; none of the remaining half shall

be less than *thirty-five* feet in length, and the whole quantity shall average *forty-three* feet. The stocks are to be lined straight the siding way, and may be straight, or have a long fair curve, the other way. No sudden crooks will be allowed; both sides may be lined tapering, in conformity with the growth of the tree. The small end must not be under *twelve* inches square, clear of wane. Wane, exceeding one fourth of the width of the face of the stocks as squared, will be objectionable. At the middle of the length of the stock, the *breadth* and *depth* to be taken, and *considered* the size for *computation;* the ends must be sawed off square, to sound and perfect wood, by the contractor; the sap-wood to be excluded in the measurement.

Promiscuous timber may be got as the trees grow, and of such lengths and sizes as may be required from time to time by contract. When got as rough squared timber, care must be taken to make suitable allowances for axe marks and improper squaring; the mean size to be adopted in the computation. When delivered in the round log, for the measurement take the mean diameter, deduct from this diameter one-fourth, and the remainder will be *considered* the square of the log. The sap-wood to be excluded in the measurement of the rough squared, promiscuous timber. The keel pieces, rudder stocks, plank stocks, and promiscuous timber, to be measured by the cubic foot.

White oak plank.—One-half of the quantity required to be forty-three feet in length, none of the second half to be under thirty-five feet in length, and the whole to average forty-three feet in length.

The centre or pith of the tree to be taken out. It is to be sawed to *full and even* thicknesses. No sudden crooks will be allowed; a long fair curve is admissible.

At the middle of the length of the plank take the breadth and the thickness, which are to be *considered* the sizes for computation; the measurement to be *board measure.* No sap-wood allowed in the measurement.

Gun-carriage timber, thick stuff for caps and trestletrees, must have the centre or pith taken out, to be got to sharp corners, (that is, clear of wane,) each piece to be one foot longer and two inches larger each way than the net dimensions; this will exclude all sap-wood. To be measured as board measure.

Butts, under twelve inches diameter at the small end, and got in the round log, to be purchased by the piece. All oak butts twelve inches diameter, and upwards, at the small end, (in the round log), will be called Promiscuous timber, and be measured by the cubic foot.

White oak staves and heading, are to be the lengths, breadths, and thickness agreeably to contract. All staves and heading are to be *riven*, and not sawed to their breadths and thickness. They are purchased by the net thousand.

The inadmissible defects in white oak are the bunch worms, large worm

holes that will injure, ant holes, wind and ring shakes, splits, rot, sap-wood, uneven thickness in plank, cross or diagonal grain. Old brittle oak is not fit for the navy. The average lengths must be attended to, and the bark must be removed from all white oak, except from the small butts required for the cooper.

White oak knees are to be received agreeably to the following table and directions; the price may be changed by contract for each sided inch, but the system is continued as adopted by the Bureau of "Construction, Equipment and Repairs," on the 26th June, 1847. Live oak and hackmatack knees will be measured by the same rule of measurement. The prices of white oak knees are included in the table, to show the ratio of prices which should govern in regard to the length of the body and arm.

Sided.	Length of body.	Length of arm.	Value per sided inch per foot, of the Body. Cts.	Arm. Cts.	Total value per sided inch. Cents.	Total value per knee.
5 inch	4 to 6 feet	3½ to 4½ feet	3.1	5.9	33 to 45	$1 65 ... $2 25
6 "	4½ " 6 "	4 " 5 "	3.6	7.6	47 " 60	2 82 ... 3 60
7 "	5 " 7 "	4½ " 5¼ "	4.0	9.3	60 " 77	4 20 ... 5 39
8 "	5 " 7 "	4¾ " 5¼ "	4.3	10.5	71 " 85	5 68 ... 6 80
9 "	5½ " 7½ "	5 " 5½ "	4.5	11.6	83 " 98	7 47 ... 8 82
10 "	6 " 7½ "	5¼ " 5¾ "	4.7	12.2	92 " 105	9 20 ... 10 50
11 "	6½ " 8 "	5½ " 6 "	4.8	12.6	100 " 114	11 00 ... 12 54
12 "	6½ " 8 "	5½ " 6 "	4.8	12.7	101 " 115	12 12 ... 13 80

In the above table an increased price is given in proportion to the length of the arm and body. No extra price will be allowed for any increase of length, of less than six inches in the body and three inches in the arm, from the lengths above given; nor must any be received of less length than the shortest in the table.

The body to be sided to the diameter of the arm, the siding way taken at the middle of the length of the arm.

Three-fourths of the smallest diameter of the arm, at two-thirds of its length clear of the body, is to be considered the net siding, to which the knee must work, and which will be paid for. The length of the arm to be measured from the centre of the body.

The moulding size of the end of the body must be equal to the net siding of the knee; and the throat, to the angle, must not be more than three times, nor less than twice and one-half, the rough siding of the knee, and must not be wounded.*

Care must be taken that the end of the body above the arm be not cut too short, or the knee cannot be received. Limb knees, in all cases, will be preferred.

The price above given is for square and insquare knees. Outsquare

*That is, no timber to be taken from the throat of the knee. This note is intended for contractors.

knees must not exceed 16 degrees, for which the price will be three-fourths of the square knees.

Example of the price per inch—

8-inch knee, shortest body 5 feet, at 4 cts. 3 mills per foot,	cts. 21.5
shortest arm 4¾ feet, at 10 cts. 5 mills per foot,	49.8
Per sided inch	71.3
8-inch knee, longest body 7 feet, at 4 cts. 3 mills per foot,	30.1
longest arm, 5¼ feet, at 10 cts. 5 mills per foot,	55.1
Per sided inch	cts. 85.2

The same proportions and ratio of prices will govern for "boat knees."

Fine Grain Southern Yellow Pine.—*Beams* are to be got by a mould, or to the sweep or spring, agreeably to contract, and are to be lined straight the siding way. To be got one foot longer, and two inches larger in the moulding and siding, than the net dimensions. When dressed to their net sizes, there is to be no sap-wood on them. When the beam is to be made of more than one piece, no scarph or lap to be cut by the contractor. To be measured by the cubic foot, and the ends sawed off square to sound and perfect wood.

Plank stocks must average forty-five feet, and no piece shall be under thirty-five feet in length. Two sides must be lined straight, but may retain the natural taper of the tree. The other two sides may be lined of parallel breadths, or with the natural taper; either will allow the pith or centre to be taken out, which should be done; a long fair curve will not be objectionable, but no sudden crooks will be allowed. The small end shall not be less than *four-fifths* of the butt end, and the small end shall not be less than twelve inches square clear of wane. No more sap-wood than one-eighth of the breadth of the face from each corner will be allowed on the stocks; the sap-wood to be excluded in the measurement; axe marks and improper squaring to be noticed, and allowances made for them. Both ends to be sawed off square to sound and perfect wood, before offered for inspection. To be measured by the cubic foot.

Promiscuous timber is to be rough-squared as the trees grow, and to such diameters as the contract may specify. Care must be taken to make suitable allowances for axe marks and improper squaring; the sap-wood to be excluded from the measurement. To be measured by the cubic foot.

Plank must be square-edged, and sawed to an even thickness. To average forty-five feet; and no plank to be under thirty-five feet in length; the width at top end to be *one-fifth* less than the width of butt end; the top end never to be under ten inches wide; the thickness and breadth to be named in the contract. To be measured as board measure.

Masts and bowsprits, topmasts, topgallant masts, booms, yards, and half yards.—All the pieces required to make the above masts and spars are to be got two feet longer and two inches larger each way than the net dimensions; the net dimensions to be named in the contract. No more sap-wood than one eighth of the breadth of the face from each corner will be allowed on the pieces. The sap-wood to be excluded in the measurement. All the pieces are to be got out to the form required, viz: when intended for lower masts, to be lined and got out as pieces for lower masts should be; and when for topmasts, topgallant masts, booms, and yards, to be lined and got out accurately to the form required for such pieces. All such timber to be got square, to be properly hewed; the ends to be sawed off to sound and perfect wood before offered for inspection. To be measured by the cubic foot.

The defects in yellow pine are as follows: large sound and rotten knots, rot, splits, shakes, *double heart,* cross grain pieces, which have been *tapped* for the purpose of getting the turpentine. Plank stocks and plank are to be clear of knots and all defects. Mast, spar pieces, and promiscuous pine, are to be clear of all knots that will constitute a defect; none but the very best quality will be received.

White Pine.—*Plank stocks* are to be clear of knots, splits, shakes, rot, and all other defects; the average lengths and sizes to be as the contract may require. No more sap-wood than one-eighth of the breadth of the face from each corner will be allowed on the pieces offered for inspection. The sap-wood to be excluded in the measurement. The small end shall not be less than *four-fifths* the size of the butt end; both sides to be lined straight; the ends sawed off to square sound wood.

There are but *three* qualities of white-pine boards and planks.

No. 1, *or first quality,* shall be all white-pine plank and boards, which are perfectly clear of all defects: such as knots, rot, stains, splits, shakes, coarseness of quality, sap-wood, holes, and uneven sawing.

No. 2, *or second quality,* shall be such white-pine plank and boards as shall not have more than *three* medium size knots within the *surface* of fifteen feet; to be clear of other knots, sap-wood, rot, shakes, splits, holes, and uneven sawing.

No. 3, *or third quality,* shall be white-pine plank and boards fit for stage plank, and sheathing for house-tops to receive a slate roof. No knots in the stage plank shall be close together, and branch off diagonally so as to weaken the plank. The stage plank is to be sound and strong, and the boards are to have no knots that will come out, and not enough to injure them for the purpose intended. All plank and boards to be measured by board measure.

Mast and Bowsprits, when to be made of more than one piece, the pieces are to be nicely hewed straight, and square; each to be two feet longer

and two inches larger than the net dimensions named in the contract. If one piece, for a mizzen-mast, it may be got in the round, but of due proportions, and two feet longer and two inches larger than the net size. No sap-wood will be allowed to be on the pieces when brought to the net size Should the bowsprit be in one piece, it should hold its size one-third from the heel or butt; the *bottom* and sides must have a regular curve; the upper side lined straight; the same allowance for workmanship as above. On none of the pieces are there to be knots that will constitute a defect; the whole to be clear of shakes, splits, rot, chafes, to be fresh cut, and in all respects agreeably to contract. To be measured by the cubic foot.

Spruce Spars—Are to be straight. Such as measure from four *to* ten inches, both sizes inclusive, are to be considered measurement spars, and are to be measured by the inch, taking the diameter clear of bark one-third their length from the butt ends.

Those under four inches are to be considered *poles*, and are purchased by the piece. All spruce spars, the diameter of which is above ten inches, one-third of their lengths from the butt ends, are to be called *piece sticks*, and are purchased by the piece. All spruce spars of *seven inches* diameter, *and less*, *must* have five feet of lengths for every inch in diameter; all *above* seven inches diameter, must have four feet of lengths for each inch in diameter. The whole are to have the bark *on*, and to be fresh and sound, clear of rot, shakes and splits, and to hold their sizes well up.

Red Cedar.—*Red Cedar* should be knotty when intended for timbers; the knots to be hard and solid, and be clear of rot, splits, shakes, and all other defects. When in the round log, to be measured as other round logs; in all cases to be measured by the cubic foot.

Yellow Locust—To be of a "greenish yellow color;" to be clear of rot, splits, shakes, worm holes, and all other defects. To be measured by the cubic foot in the round log or square.

White-ash Logs—To be young and tough, clear of rot, knots, splits, shakes, red, or other stains; if old and brittle, it will be rejected. To be got to the lengths and diameters agreeably to contract, and to be measured by the cubic foot.

White-ash Plank and Boards—To be clear of rot, knots, shakes, splits, cross-grain, red, or other stains; to be sawed to even thicknesses. To be measured by board measure.

White-ash Oar Rafters—To be got to the dimensions named in the contract. They are to be young and tough, straight-grained, clear of knots, splits, stains, rot, and all other defects. To be measured by the lineal foot, to be riven, and to be clear of centre pith.

Hickory, or White-walnut—Is to be young and tough, clear of rot, splits, shakes, and all other defects. It is seldom used, except for capstan bars

and handspikes; they are to be riven and hewn, not sawed, to dimensions; to be purchased by the piece, and got out agreeably to such dimensions as may be called for from time to time. To be got square to prevent springing.

HACKMATACK KNEES—Are to be clear of splits, shakes, and rot, and to be got agreeably to the table for white-oak knees.

BLACK-WALNUT—To be clear of rot, splits, shakes, and knots. When got in the round log, to be measured as round timber. See the measurement of promiscuous white-oak in the round log. All plank and boards to be of the same good quality, and sawed to even thicknesses. To be measured as board measure.

MAHOGANY—Of all kinds, is to be clear of rot, splits, shakes, and all other defects. To be measured as board measure.

ELM—Gun-carriage timber is to be clear of centre-pith, rot, splits, and shakes, *yellow* and other stains.

Plank and boards also to be clear of the above defects, and sawed to even thickness. The *centre* or *pith* in all timber is a *defect*, and should be taken out in all cases when it can be done to advantage, especially all timber intended for keelsons, capstans, caps, trestletrees, combings for hatches, and all pieces for gun carriages, &c.

The following computations and remarks are intended as a guide for *contractors*, who have not made themselves acquainted with the mensuration of timber, plank, and boards. It is considered fair to measure round timber as follows: take the *mean diameter* of the log, *clear of bark*, deduct from this diameter one fourth, and the remainder is to be *considered* the square of the log.

EXAMPLE.—Mean diameter 20 inches; deduct one-fourth, the supposed square is equal to 15 inches. Then 15 in. × 15 in., × 43 feet in length, the product divided by 144, is equal to 67 cubic feet 2½ inches.

The *true square* of the above piece would be about 14 inches. In the above computation, all the timber will be paid for that should be used in ship-building. To measure a piece of round timber as a cylinder, would produce more solid feet than could be useful.

All square and unequal sided timber, such as frames for ships, mast and spar pieces, beams, plank stocks, and rough squared promiscuous timber, are to be measured as follows: the length, mean breadth, and thickness being attained, the computation will be agreeably to the following examples:

Say a first futtock, the length of which is 20 feet, *mean*, moulded breadth 17½ inches, siding size or thickness, 15 inches.

EXAMPLE.—20 feet × 17½ in. × 15 in., and the product, divided by 144, is equal to 36 cubic feet, 5½ inches.

Or a plank stock, mast piece, or beam, 43 feet long × 15 in. × 15 in. ÷ 144 = 76.1 cubic feet.

The two sides are never to be added together, and the one-half taken as the mean size. To find the *solidity* of timber, multiply the *breadth* by the *depth*, and that product by the *length*, as above.

All plank and boards, all gun carriage timber, thick stuff for caps and trestletrees, combings for hatches, and mahogany of all dimensions, will hereafter be measured by the computation known as *board measure*.

To find the *measure* of plank, boards, &c., above-named, proceed as in the following examples:

16 feet in length, 12 inches wide, 1 inch thick, or *under* 1 inch thick.

$$\begin{array}{r} 16 \\ 12 \\ \hline 12)192 \\ \hline 16 \end{array}$$

16 feet board measure.

16 ft. long, 12 in. by 1⅛ in. thick.

$$\begin{array}{r} 16 \\ 12 \\ \hline 192 \\ 1\tfrac{1}{8} \\ \hline 192 \\ 24 \\ \hline 12)216 \\ \hline 18 \end{array}$$

18 feet board measure.

And thus the computation, by an increase of thickness, advances in quantity. It will be seen by the contractor, that the *three* inch plank contains *twice* as much in quantity as the plank *one and a half inch thick*. Twelve *feet* board measure will make one cubic foot.

CHAS. WM. SKINNER,
Chief of Bureau of Construction, Equipment and Repairs.

Approved:
JOHN Y. MASON.

A NEW NAME FOR THREE-MASTED SCHOONERS.—A new and appropriate designation for three-masted schooners has been agreed upon in Charleston, S. C., which we hope to see generally adopted by our mercantile marine. It is the suggestion of T. Tupper, Esq., one of the oldest merchants of Charleston, and is equally felicitous and expressive. The name is "Tern," and signifies threefold—consisting of three. This word is also the common name of a sea-fowl closely resembling the gull. We would now suggest that the new rig of square-sails on foremast, and fore-and-aft on main and mizzen, be denominated BRIGAN-'TERN,' instead of Barque, being a Brigantine of three masts.

For the Nautical Magazine.

OLD SALT ON SHIP'S HEADS.

MESSRS. EDITORS:—

IT is some time since I troubled you with a yarn for the NAUTICAL MAGAZINE, but be assured that it is not because I do not take an interest in it, but as you seem to have been well provided with that, which looks more ship-shape, from the pen of those accomplished navigators, MAURY and FORBES. It is only to lend a hand, by taking a turn, that you may not lose what they pull in, (as they float along the line of improvements, in order to take a fresh hold,) that I am found on board of this noble craft—Progress; hence you will bear with me if, while taking in the slack, I should feel disposed to make a few suggestions.

I am glad that you have opened fire on those sleepy looking sheers, which many of our (otherwise fine looking) ships now wear. This is a nail in a sure place, and I would suggest another, which, doubtless, has not escaped your notice. I allude to these abominable heads which so many ships carry out of the port of New-York. Certain localities have almost, from time immemorial, been charged with those unsightly heads, and, at one time, it was part of the contract, (in order to make some of our ships passable in a foreign port,) that they should have a New-York head; but I discover that, not only in the East, but in New-York, and South and West, the heads of some vessels now seem to fit like a *purser's shirt* on a *hand-spike*. Many of the full figures on our clipper ships would show to better advantage on a log cabin, or on a barn, than on (what in other respects would be) a fine looking ship.

It appears to me that a fine-modelled ship does not require these excresences to show herself to advantage. A handsome ship, like a handsome woman, requires no gilded ornaments to set forth her qualities; but, on the contrary, the ill-shapen ship, like the homely woman, requires the tinsellings of show to draw the attention from the irregularity in the proportions of feature.

Some of those full figures hanging under the bowsprit of our clipper-ships, as well as those tub bottoms with clipper tops, appear to be hanging in buckets to dry, after having been keel hauled—a punishment, I think, no feminine form should be subjected to, no matter what may have been the offence.

OLD SALT.

LAUNCH OF THE GOVERNMENT SCHOONER LA CANADIENNE.

THE launch of this elegant specimen of a dashing cruiser, just built for the Provincial Government, by T. C. Lee, Esq., took place at his ship-yard, Hare-Point, and passed off most auspiciously. This event is one of comparative interest in the affairs of Canada, *La Canadienne* being the first armed vessel constructed at the expense of the Province, and owned by our Government; let us hope she is merely the pioneer of a future Canadian navy, and that her fortune may prove that colonists, not only as ship-builders but as mariners, are able to earn a portion of the renown such as has been so well won by the British Empire. *La Canadienne*, manned by French Canadian sailors, is to be employed under the command of Captain Fortin, in the protection of the Fisheries, for which service she will be ready in a few days. She has the *fine lines of the yacht America*—of a sea-going yacht, with all the substantiality of a strong, stout man-of-war. Her hull is long, low and sweeping; her masts not very tall, but well-proportioned and raking, whilst her rig, that of a two-masted schooner, sets her off admirably, and gives a saucy character to the handsome craft. She carries four guns, two six pounders and two threes. Of her tonnage and class she is one of the best designs ever turned out of any ship-yard at this port, and reflects great credit as well upon Mr. Lee, as upon Mr. William Power, by whom she was modelled. Lloyd's Surveyor declares her equal to any British built vessel. She is constructed of the best materials, the workmanship is good, and the figure-head (a lady with a maple leaf in her hand)

is very appropriate, and has been beautifully carved by Mr. William Black, St. Rochs. The main cabin measures 15 × 22 feet, with berths on each side; immediately beneath it is the powder magazine. The after cabin, or saloon, measures 15 × 8 feet, and has state-rooms on each side; near this are the store-room, pantry, closets, &c., &c. The arrangement of both cabins is excellent, and they are well lighted and ventilated. The forecastle is capable of accommodating 24 men, and is also light and airy. *La Canadienne* not only looks well on the water, but possesses those properties that stamp her at once as well suited in every useful respect for the service for which she is required. The following are some of her principal dimensions:—

Length between perpendiculars	93 feet.
Breadth of beam	23 "
Depth of hold	10 "
Height of Mainmast	78 "
Diameter of do	22 in.

QUEBEC.

THE GREAT LONDON STEAMSHIP.

OUR transatlantic friends are generally much more cautious than we are, in entering upon new projects, particularly in the nautical department of the mechanical world; but when they do embark, they are much more lavish of expenditure in the execution of their plans. That we make as many, and perhaps more blunders than they do, cannot be well denied, but then they are of less moment, and are more easily remedied. If we build a steamboat, and she lacks stability, or draws too much water, we cut her in two, and add a few transverse sections to the middle, and all is well. If she be too dull, we sharpen the bow and stern, and then we try again. If she has too much sameness midships, we haul her out, and increase her breadth from the lower part of the bilge to deck; this is all very well, for *those who foot the bills, direct the operations*, and of course they only are the losers, and like Dr. Franklin when he was a child, they *pay very dear for the whistle.* We sometimes make blunders in Ocean Steamers, by getting them too narrow, or, as we

should have said, *too deep*, when we find it necessary to bolt a few logs to the side, to keep them upright; but this is soon done, and does not cost much, and is regarded by some persons as the surest method of determining the requisite breadth a vessel should have, in order that she may maintain the upright position, more particularly if they are not familiar with those complex computations of stability. Then again, the vessels built in this wooden country are of timber, and, as a consequence, alterations are more readily made; and these are continued until the vessel becomes profitable, or is worn out. This does not reflect greatly to our credit, either as Marine Architects or as Ship-Builders; but let it suffice for the present to say, that we are improving and enlarging our stock of knowledge, though it be at the dearest rate.

But what shall we say of our neighbors on the other side of the Atlantic, who have embarked in this great Iron Steamship enterprise, which must prove a failure, *mechanically and commercially?* We pronounce her a mechanical failure, because of her disproportionate dimensions, which are as follows—length 680 feet, breadth 83 feet, depth 60 feet. Vessels are often built upon the same principle upon which houses are built, which, if we understand it, is this—that the area of roof required to cover a six-story house, is no greater than if it were but two stories high; this will do very well where land is costly, but if the land were a gratuity, would the party then find it more profitable or convenient, to increase the altitude rather than to increase the base? The great length of this vessel should have admonished her projectors that her draught of water should have been comparatively light; and that the height above water should also have presented the least possible resistance, while her breadth, from which every profitable quality finds sustenance, should have been increased; with these elements of construction, she might have proved to be a much better investment than she will now be found, and why? because, first, the advantages of length are not secured in this vessel: for if length be given to a vessel, it is to secure one of those qualities—first, speed; second, light draught of water, without which the idea of great speed is futile. In this case, we find a surplus of depth equal to at least 20 feet, which must not only be carried upon

the same bottom, but which adds very materially to the draught of water, and the weight of which would have paid better in freight, and might have been saved in the first cost of the vessel. Besides the additional difficulty in finding a harbor and dock for so heavy a draught of water; the ship being of iron, must be cleaned and painted occasionally, or be subject to a serious drawback in speed.

These are, however, only a part of the mechanical difficulties, that this monster ship must meet, or science and experience in ship-building is all moonshine.

We shall now notice the commercial difficulties her projectors must meet, when she is in actual service. The sailing ships of 2,000 tons, find it a most difficult task to secure 500 passengers, and feel glad indeed if, after drumming them together for weeks, they are at last successful. It is often the same with freight. Will it be less difficult to perform the same labor for this vessel? Will merchants ship goods—will passengers travel, and pay for the privilege of going in the largest vessel in the world, when their business does not demand it? Can this Company carry freight and passengers to Australia at such rates, as to induce shippers and travellers to wait for their vessel, at a great disadvantage to themselves? Has the transportation of troops become an object of trade to an extent, which will justify the construction of a vessel like this one? Her projectors seem to suppose that freight and passengers are consequent upon the construction of the vessel, just as some of the Rail-Road Companies have on this side of the Atlantic assumed, that if the road was only built, the travel would inevitably follow—and our transatlantic friends prospectively see the goods stored, and the passengers waiting for the time to take their appropriate place in this monster of the deep. We hope they may not be disappointed, but have our fears.

We have only to say, that inasmuch as she is overburdened mechanically with herself, so will she be financially too expensive to be profitable, both in first cost, and in management. The 20 feet excess of depth on the topside is a large item of expenditure, from which no dividends can ever be declared, inasmuch as its weight must always be carried as a part of the

cargo, from which no freight is received. Thus, 2,500 cubic feet of capacity at least, if it were on shore in the form of a *store-house,* might serve for storage, and the vessel being relieved of its weight, could accommodate freight and passengers in its stead, and be much more efficient, because of a much lighter draught of water.

THE CLIPPER-SHIP STAG-HOUND, OF BOSTON.

THE construction of this ship may be said to mark the introduction of the late clipper era at Boston. The building of fast vessels for foreign trade had for several years been adopted in New-York, having been first undertaken by Wm. H. Aspinwall, for whom Smith & Dimon constructed the clipper-ship *Rainbow,* in 1848, which was followed by the *Howqua* and *Samuel Russell,* by Brown & Bell; and the famous *Sea-Witch,* also built by Smith & Dimon. It will be entirely proper to add, that the model of the *Sea-Witch* had more influence upon the subsequent configuration of fast vessels, than any other ship ever built in the United States. Her tables will be found in Griffith's MARINE AND NAVAL ARCHITECTURE, published in 1850. In 1848 and 1849, New-York entered upon the era of steamship building, and by her late experience in modeling sailing vessels for high speed, found herself competent to contend successfully with the marine architects of Great Britain, and set afloat steamer after steamer, which found no match under any foreign flag upon the ocean.

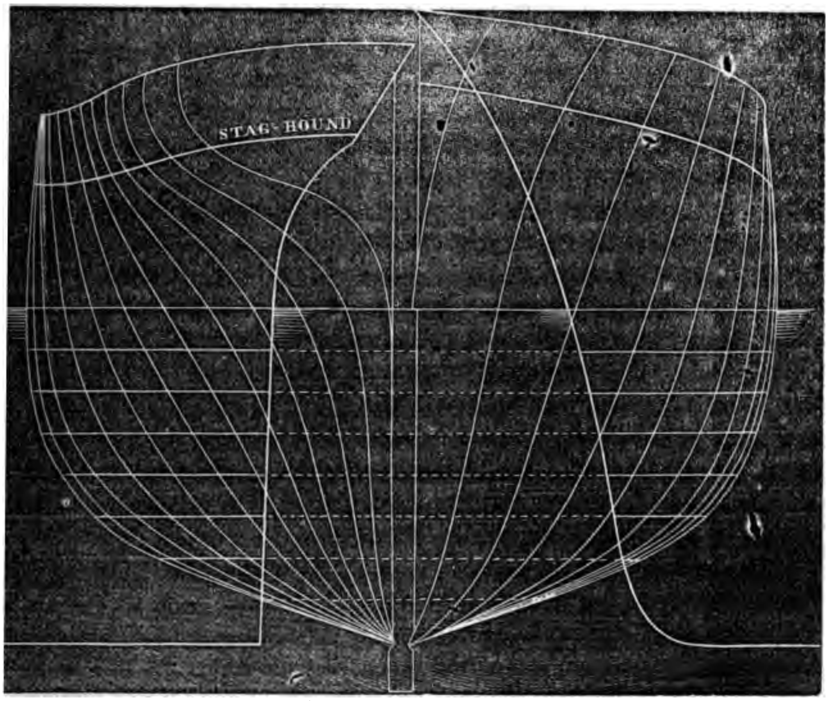
Such was the condition of enterprise in New-York, for several years, before Boston awoke to distinguish herself in *clipper* building, and give to the world many of the fastest fleets, and largest ships in commercial service. The bold mind of Donald McKay grew restless under the idea, that a sister city was monopolizing the construction of fast vessels, and for many years he urged Boston merchants to enter the lists with Messrs. Aspinwall, Capt. N. B. Palmer, and others, and dispute for the palm of speed.

For a long time it was held by mercantile opinion that fast

vessels were not so profitable as duller sailers, carrying larger cargoes; but the rise of freights, consequent upon the discovery of gold, and the emigration to California, determined the argument in the favor of all ambitious ship-builders and merchants, and *clippers* became the watchword of commercial men all over New-England, and in New-York. It only remained for the enterprise and genius of Boston to find exponents of her will among merchants and mechanics, to lay the foundation of an era in ship-building and navigation which should astonish the world. The leading minds at length stood forth.

Messrs. Geo. B. Upton, and Sampson, and Tappan, ordered the construction of the *Stag-Hound*, at the hands of Donald McKay, to exceed the tonnage, and excel the speed, of any ship of her class afloat. She was designed longer and sharper than any other vessel in the merchant service in the world. Her model was not undertaken without a thorough exploration of all discovered mysteries in modeling for speed, and the most celebrated models were sought out, and examined with care. The result was the production of the *Stag-Hound*, a vessel designed with special reference to her builder's beau ideal of perfection in every sea quality. His intelligent owners gave him the entire responsibility of design, model, construction, rig, and finish, while they stood by, having no other duties to perform than the financial task of footing the bills. To the wise and generous course of the owners, Mr. McKay was indebted for his opportunities for success. Nothing more clearly indicates the taste of a mercantile community than its ships; and nothing bears stronger testimony to the greatness and liberality of the mercatile mind, than the spirit manifested in carrying forward its enterprises. The noble, the generous, and the strong, are ever found wise and successful. The common manner of ordering a new ship, is for the merchant to select, or dictate, dimensions and model, and sketch a few specifications in a contract, which, when fulfilled, terminates the builder's responsibility. The success or failure of a ship, under such circumstances, ought to be, but seldom is, attributed to the merchant alone. This system is so common in all seaports, that builders rarely have an opportunity to show their skill as *designers*. As a general rule, the

merchants, not the mechanics, ought to be held responsible for the qualities of their ships. Yet, in almost every instance, without exception, where ship-builders have had an opportunity of displaying their skill in the finer duties of their vocation, the result, as in the case of the *Stag-Hound*, has been most satisfactory.



The dimensions of the *Stag-Hound* are as follows :—Keel, 207 feet; between perpendiculars on deck, 215 feet; beam, 40 feet extreme; hold, 21 feet; and registered tonnage, 1,600 tons. Her depth of keel is 46 inches; dead rise at half floor, 40 inches. Perhaps the gravest mistake in her model, consisted in the great amount of dead rise, detracting from her stability and capacity, without a commensurate return in diminishing the absolute *resistance*, as it has been thought to do. Her keel is of rock maple and oak in two depths, sided 16 inches, and bolted with

copper. The floors are sided from 10 to 12 inches, and moulded from 14 to 16 inches, bolted with 1¼ inch copper bolts. Her top timbers are of hackmatack, but the rest of her frame, and the stanchions, are of white oak. She has three depths of midship keelsons, which, combined, mould 42 inches, and side 15 inches. The sister keelsons are 14 inches square, bolted diagonally through the navel timbers, or first futtocks, into the keel, and horizontally into the lower piece of keelson, and each other. Her hold stanchions are 10 inches square, kneed to the beams, and to the keelson.

The ceiling on the floor is 4½ in., square bolted; that from the bilge to the deck, in the hold, is 7 in. thick, scarphed and square bolted. A stringer 12 by 15 in. receives the ends of the hanging-knees, which are of hackmatack in both decks. The hanging-knees in the hold are sided from 10 to 11 in., moulded from 2 ft. to 26 in. in the throat, and have 16 bolts and 4 spikes in each. In the between-decks, the knees are sided about 10 in., and moulded in the throats about 20 in., fastened with 18 bolts and 4 spikes. The lower deck beams average about 16 by 17 in.; and those of the upper deck are 10 by 16 in., of hard pine. There is a pair of pointers 30 ft. long in each end; and three breast-hooks, and after-hooks, all of oak, closely bolted. The hold is calked and payed, from the limber boards to the deck. The height between-decks is 7 ft. The water-ways of lower deck are 15 in. square; the strake inside of them, 9 by 12 in.; and the two over them, combined, 10 by 18 inches. The ceiling above is 5 in. thick, square bolted. The between-deck stanchions are of oak, turned, secured with iron rods through their centres, which set up below. The upper deck water-ways are 12 in. square; and the two strakes inside of them, each 4½ by 6 in., let over the beams below. The planking of both decks is 3½ in. thick, of white pine. Her garboards are 7 in. thick, bolted through the keel and each other, and through the floors, and riveted. The strakes outside of them are graduated to 4½ in. on the bottom; and the wales, of 16 strakes, are each 5½ by 6 in., planked up flush to the plank-sheer. Her stanchions are 8 by 10 in., and the plank-sheer and rail, each, 6 by 16 inches. The bulwarks, including the monkey rail, are 6½ ft. high; and

between the main and rack rails, there is a stout clamp, bolted through the stanchions, and through both rails. The bulwarks are very narrow, tongued and grooved, and fastened with composition spikes. Great pains were taken in driving her tree-nails and butt-bolts. She was salted, and has ventilators in her decks and plank-sheer, fore and aft. Her bowsprit and windlass-bitts, also the foretopsail sheet-bitts, are of white oak, strongly kneed above and below. Her main topmast stays lead on deck, and set up to bitts before the foremast. She has a top-gallant forecastle, at the height of main rail, in the after-wings of which, there are water-closets for the use of crew. Abaft the foremast, she has a house 42 ft. long by 24 ft. wide, and 6 ft. high, for the crew, with apartments for galley, store-room, &c. The upper part of house is ornamented with panel work.

Her cabins are under a half poop-deck, the height of the main rail, and have a descent of three feet below the upper deck. Along the sides, and around the stern, the poop is protected by a rail worked on turned stanchions. The poop is 44 ft. long, and in its front is a portico to the entrance of the cabins. The after cabin is 32 ft. long by 13 ft. wide, and 6 ft. 8 in. high. Its after-division is fitted into a spacious state-room, with two berths. Before this there is a water-closet on each side, then a state-room; before that a recess of eight feet on each side, and then two state-rooms. The sides of the cabins are splendidly finished with mahogany Gothic panels, enameled pilasters and cornices, and gilded mouldings. It has a large skylight amidships, and every state-room has its deck and side-light also. The cabin furniture is first class. The forward-cabin contains the captain's state-room, which overlooks the upper deck on the starboard side; it also contains the pantry and state-rooms for the three mates and the steward. It is 12 by 18 ft., neatly painted and grained, and lighted as abaft. Inside the ship is painted pearl color, relieved with white; and outside, black, from the water-line to the rail. She has patent copper pumps, which work with fly-wheel and winches,—a patent windlass, with ends which ungear, and two beautiful capstans, made of mahogany and locust, inlaid with brass. She has a cylindrical iron water tank of 4,500 gallons capacity, the depth of the ship

secured below the upper deck, abaft the mainmast, and resting upon a bed of timbers over the keelson.

MASTS AND SPARS.

The masts of the *Stag-Hound* rake alike, viz.:—$1\frac{1}{4}$ in. in the foot. The distance from the stem to the centre of foremast, on deck, is 50 ft.; thence to the main, 67 ft.; thence to the mizzen, 56 ft.; and thence to the stern post, 42 feet. The following are the dimensions of her masts and yards:—

	Diameter. in.	Length. ft.	Mastheads. ft.
Fore	32½	82	13
Top	16	46	9
Topgallant	10	25	0
Royal	9	17	0
Skysail	8	13	pole.. 7
Main	33	88	14
Top	17½	51	9½
Topgallant	12	28	0
Royal	11	19	0
Skysail	10	15	pole.. 9
Mizzen	26	78	12
Top	12½	40	8
Topgallant	9	22	0
Royal	8	16	0
Skysail	7	11	pole.. 6

YARDS.

Fore	20	72	yard-arms.. 4½
Top	15	57	5
Topgallant	10	42	3
Royal	7	32	2
Skysail	6½	24½	1½
Main	22	86	4½
Top	17	68	5
Topgallant	15	53	3½
Royal	10½	42	2½
Skysail	7	32	1½
Crossjack	16	60	4
Mizzen topsail	11½	48	4½
Topgallant	10	36	2½
Royal	7	27	1½
Skysail	6	22	1
Bowsprit	28½	24—4½ in. steve.	

	Diameter. in.	Length. ft.	Mastheads. ft.
Jibboom	$16\frac{1}{2}$	38	outside of cap, divided at 18 and 15 ft. for inner and outer jibs, with 5 ft. end.
Flying jibboom	18 ft. outside of wythe, with pole		4
Spanker-boom	13	60	pole.. $2\frac{1}{2}$
Gaff		44	5
Fore and main spencer gaffs, each		25	2

Her fore and main are made masts; the former being $29\frac{1}{2}$ in., and the latter 30 in. in diameter at the truss bands. Her topmasts and jibboom are of hard pine.

The fore and main rigging is 10 in., four stranded, patent rope, wormed and served over the ends up to the leading trucks; the mizzen rigging is 8 in., the fore and main stays, $9\frac{1}{2}$ in., the fore and main topmast backstays, $9\frac{3}{4}$ in., the topmast rigging, $4\frac{1}{4}$ in., set up on the ends; the mizzen topmast rigging, $4\frac{3}{4}$ in., mizzen topmast backstays $7\frac{3}{4}$ in., fore and main topgallant backstays and jibboom guys, $6\frac{1}{2}$ in.; and the other standing rigging in like proportions. She has chain bobstays and bowsprit shrouds, martingale stays and guys, and topsail sheets and ties, patent trusses, &c. Her fore and main chain plates are $1\frac{7}{8}$ in. iron.

With respect to her model, it will be seen that the floor has a large angle of dead-rise, and is long in a fore and aft direction. When launched she drew $10\frac{1}{2}$ ft. forward, and $11\frac{1}{2}$ ft. aft, including 39 in. keel, clear of garboards. In January, 1851, the *Stag-Hound* sailed from New-York for San Francisco, under the command of Capt. Richardson. She performed the voyage in 115 days, or 107 days sailing time, having lost her topmasts, and touched at Valparaiso.

She has made three other passages from New-York to San-Francisco in 124, 121 and 110 days respectively. The sailing distance, on the last voyage, was 16,408 miles, and the daily average 158 miles.

From Whampoa to New-York, the *Stag-Hound* has made three passages in 85, 91 and 92 days. All these, and her many other passages, are considerably shorter than the average of clipper voyages in the corresponding months of the year, between the same ports; yet the *Stag-Hound* has failed for want of opportunity to reach a degree of speed quite equal to the best performances of ships, either of her own, or of less displacement.

ON STEAM AS A MOTIVE POWER IN NAVAL WARFARE.

HAVING taken several occasions to discuss the applicability of steam for propulsory purposes on board vessels of war during the past five years, when we have presented our views as a practical architect, urging not only the adoption of steam, but the most efficient description of *model* in the vessels of the United States Navy, it gives us pleasure to present the very intelligent views of a nautical writer of Boston, R. B. Forbes, Esq., upon the same subject, in 1849, which was communicated to one of the papers of his city, and which very nearly coincides with our own.

We republish the argument of Mr. Forbes, in order to show the grounds of his opinions six years ago upon this subject, and to furnish the authority for the decision of the Navy Department in recommending the construction of six steam propeller frigates, the plans of which very nearly coincides with the design sketched out in the following article, with the exception of their enormous draught of water, which we would set down as being, at least, six feet too great.

It does appear to us, that we should try again, especially as the ships will be needed, and see what may be done to give our war vessels a reasonable draught of water in conjunction with other rational qualities. With regard to "sacrificing strength and model for carrying" to "speed," of which Mr. Forbes speaks in reference to the war steamer Princeton, we would remark, that the history of marine and naval architecture, shows the rule of "sacrifice" to have ever been in favor of *dullness;* and in most cases, where speed has been obtained at the cost of cargo, as in some of our clippers, the fault has been in too great draught of water, consequent upon an extremely sharp bottom, combined with a contracted proportionate amount of breath. We do most unhesitatingly aver, that the same weight, (and of course equal cost), of shell may be made to carry *more cargo,* and *sail faster,* on a *minimum,* than a maximum draught of water. We have yet to see the large ship, of the present model and dimensions, which can *carry* and *sail* equal to many of our flat coasting vessels, in proportion to the *weight* and *cost* of the *hull.*

But, concerning the subject of this article, Mr. Forbes writes as follows:—

BOSTON, 1849.

DEAR MR. EDITOR:—

Having noticed an article in your paper of this date, on the subject of "Sea Steamers in the Navy," copied from the *New-York Gazette*, I beg leave to offer a few facts, and a few suggestions derived from those facts, and from a very limited experience and knowledge of steam, which, I trust, may not be without interest to your readers.

My principal object is to discuss fairly the merits of the paddle and the propeller, as well as the merits of regular steamers, compared with auxiliary steam-ships for war purposes. That magnificent steam-frigate, the Mississippi, is no doubt a very efficient vessel for the protection of our coast, where she may readily be kept in good trim by the proximity of the coal depot; but she is not well adapted to cruising on a distant coast. When she has a full supply of coal on board, she is altogether too deep to sail or steam to advantage; and when her fuel is reduced, she cannot steam very fast, for the reason that her paddles are not sufficiently immersed. The inconvenience of connecting, and disconnecting her paddles, is so considerable, that it is seldom done, and she is consequently a very ordinary sailing vessel; her canvas is of very little service with a side wind, and her spars are a great incumbrance when steaming dead to windward. The consumption of coal is very large, too, obliging her to leave her station in the Gulf several times to "coal up" at Pensacola. She would be more efficient as a war steamer with lighter spars, contrived to be housed at short notice, and with little inconvenience.

The Princeton,* although much, both in strength and model for carrying, has been sacrificed to speed, is a more efficient vessel than the Mississippi, as she consumes much less fuel, and can use her propeller to advantage under canvas, while she can readily ungear it so as to permit it to revolve by the impetus of the vessel under canvas, without materially obstructing her progress, excepting in quite light winds: the propeller acts equally well, whether the ship be upright or heeling over, and it is entirely out of reach of shot, as are also the boilers and machinery generally, the smoke-pipe only protruding above deck sufficiently to carry off the gas from the furnaces, and this is made to unship at pleasure; and when unshipped, or lowered like the joint of a spy-glass, the Princeton looks like any other ship, being full rigged, and exhibiting nothing to indicate a steamer. She burns anthracite coal, which would give her a great advantage, in any war with a maritime nation, over those burning bituminous coal, as she shows little or no smoke. With all the advantages named, I do not consider the Princeton as the best thing, in all respects, for a war steamer; nearly four-fifths

* The old ship of that name.

of her lower hold is taken up with her boilers, machinery and coal for twenty days steaming, leaving but little space for provisions and water for a crew of nearly two hundred and fifty souls. She is built too lightly to bear an armament, and draws a little *too much water* for a vessel of her tonnage. With all her faults, she is the best war steamer in the United States Navy, for a distant station; and the projector of her machinery, Capt. Ericsson, deserves great credit for the ingenuity displayed therein; but it would be a libel on his intelligence to say that he could not improve greatly on the Princeton.

The speed of the Mississippi and Princeton, under the most favorable circumstances for both, is nearly equal, say twelve statute miles per hour. In rough water I presume the former has the most speed, when she happens to be in good steaming trim; but the latter is doubtless much the most manageable sea-boat, and the most economical steamer.

Having compared the only two steamers in the United States Navy, of any note, I will give you my views as to what kind of vessel is best adapted to cruise away from home, and for *war* purposes.

A war steamer should have a submerged propeller protected, as well as her boilers and machinery, from shot, below the water line, but made to unship—that is to say, to take entirely out of the water, leaving the full rigged ship in a state to compete with any sailing vessel under canvas, and with sufficient steam power to give her moderate speed, say ten statute miles, which may be attained with a very moderate consumption of fuel, compared to what would be necessary to go twelve miles, and leaving at least two-thirds of the hold for fuel, provisions and water. Such a ship as this could keep the sea for months, only steaming in calms and light winds, and in getting into and out of port; in manœuvring in action—in towing sailing vessels—in carrying despatches, using her sailing properties wherever the wind would allow, and reserving the steam for emergencies—this is the true thing for war purposes. One of the advantages of strong auxiliary steam power is, that the boilers and machinery can be kept in good order more readily than in a vessel constantly under steam; and in case of meeting with accidents, always occurring to steam machinery, the ship can still do as well as other sailing ships. If she gets out of fuel, she is still capable of rendering effective service as a sailing vessel; whereas, if she has a fixed propeller or paddle-wheels, she is almost useless without fuel. There are many advantages connected with the use of paddle-wheel steamers for short routes, not exceeding the passage across the Atlantic, but they must be near the coal-yard; and for shoal water navigation, nothing has yet been found so good as the paddle-wheel on a large scale; but for cruising on the ocean, the steamer which can be converted into a first-rate sailing vessel, in ten minutes, is the most effective craft, as well as vastly less expensive.

R. B. F.

CONSTRUCTION OF THE OCEAN BIRD.

SURVEYOR'S CERTIFICATE—COPY.

"THIS certifies that the steamship Ocean Bird, of New-York, owned and commanded by Capt. John Graham, 1726 tons, three decks, and will draw, when loaded, 10½ feet of water; built at Green Point, Long-Island, 1854, of live oak, white oak and hackmatack; is copper fastened, and was coppered in September, 1854; is brig rigged. She is a strong, substantial vessel; is well kneed; is heavily diagonal iron braced on the frame and the second deck; she has eight water-tight bulk-heads, and an additional hollow keelson of iron running from stem to stern, divided into air-tight chambers which can be used for water-tanks, well secured by heavy fore-and-aft and athwartship braces. She has a vertical beam engine, 65 inch cylinder, and 12 feet stroke; is well fitted and found in all respects, and a first-rate vessel of her class, and well calculated for the transportation of passengers and troops. She is, as far as the *hull, materials* and *fastenings* are concerned, and outfits, in all respects an A 1 ship; and if she had two engines instead of a single one, she *would*, in my opinion, be equal, if not *superior*, to any steamship afloat.

"In witness whereof, I have signed my name.

(Signed) "WM. H. MERRY,

"*Surveyor and Inspector for the New-York Mutual Insurance Co., Reporter for Lloyd's at London, and for the Bureau Veritas of Paris.*"

"2,260 tons carpenter's measurement."

A duplicate of the above certificate was sent to the senior editor for his signature as builder of the vessel. We shall furnish a correct description of the vessel, up to the time of her sale, from which our readers may judge of the value of a surveyor's certificate when made and furnished to order.

There is but little in the completion of this vessel that we are fully prepared to endorse. We should have been pleased to lay before the readers of the NAUTICAL MAGAZINE not only a description of the vessel in detail, but her lines also, had our plans progressed to maturity; but it never having been our practice to *half do* our work, it would now be a most awkward task; hence we forbear to furnish the first design, while there

is none of the upper half, that we can endorse, which, like an *incubus*, hangs over the first design, to mar its proportions, and detract from its efficiency. When the proposition furnished in the last number shall have been accepted, we shall be pleased to give the lines of the vessel to the world.

The Ocean Bird has a keel, stem and stern-post of white oak; keel sided 13, moulded 12 inches. It conforms in the fore-body (as well as the post aft) to the lines of the vessel, and terminates in a thickness of half an inch at the forward edge, 6 feet above base line, above which height it extends several feet, presenting to the water the grain of the wood endwise, instead of a stem edgewise, as is usually the case—thus forming part of the dead wood, as well as the keel. This has been regarded as an improvement for sharp vessels never before introduced. The floors under the engine and boilers are of oak, sided 11 and 12 inches; forward and aft they are of chestnut. The frame, from thence upward, is chiefly of hackmatack, with chestnut crooks, sided 10 and 11 inches midships; 8 and 9 forward and aft, fastened with $\frac{7}{8}$ screw bolts. The timbering room is 36 inches midship, 40 and 42 inches at the end of the vessel, with openings equalized, or room spaced alike, and chocks firmly driven against the butts, after the vessel was raised and regulated, of yellow pine, grain running fore and aft the vessel. The entire frame was thus secured, and then the butts of the timbers were diagonally dowelled with locust treenails. The scantling of frame is $12\frac{1}{2}$ in. at keel $\times$ $4\frac{3}{4}$ at gunwale; and the wheel-houses are regularly framed with double timbers, and cross plated on the inside to the top, in connection with the cross plating on the sides, extending down to lower part of bilge $4 \times \frac{5}{8}$ inches. The centre keelson, from the boilers forward, is made of plate iron, $\frac{1}{4}$ of an inch thick, and caulked, extending quite up to the lower deck beams, 15 inches wide, and secured to the floors and deadwoods by iron straps bolted to deadwood and floors, and riveted to keelson. This keelson, as also the after one, extending from the after boilers to inner post, is also 15 inches, and of iron of equal thickness, secured in the same manner, and provided with diagonal braces, fastened to ceiling and timbers below, and to lower deck beams above. They have man holes and plates, and are designed to hold fresh water. At the termination of these

tanks or keelsons are iron bulkheads, extending thwartships to coal-bunkers forward, and to sides of vessel aft. The coal-bunker bulkheads running along the sides of the vessel are also of plate iron, fastened above and below, and secured to stanchions, caulked, and provided with water-tight slide doors at openings in fire-rooms. The centre iron bulkhead and keelson connecting with the gallows frame, and extending to, and connecting with, the tank keelson, both forward and aft, as also the iron water-tight flooring, has not been adopted as we intended. The bilge keelson is made up of yellow pine plank, with long scarphs and tapered ends, forming a mass 18 x 18 inches midships, bolted to every timber, over which it passes head and heel, and riveted. The clamps and beams of lower deck are of yellow pine, with lodge knees and bosom pieces, one carlin between. Each beam has a hanging-knee, except at the ends of the vessel; there chocks are substituted, the form being more within square than is grown in knees. Forward in the hold there are two sets of diagonal stanchions on each side, extending from the iron keelson, at bottom of beam, to the ceiling, and directly on a frame and at right angles with the same. These stanchions are kneed and chocked at head and heel, to prevent torsion, to which all sharp vessels are subject. The stanchion along the sides of the coal-bunker extend to the upper deck, and are secured with knees to a stringer under the upper deck beams. The second deck, or that which was designed to be the upper deck, has white pine clamps, 4½ inches thick, with yellow pine ceiling and water-way on lower deck. The beams are alternately white and yellow pine, with wheel-beams and boiler beams of yellow pine, from the boiler-beams forward, and also aft (and intended to be midships). The lower side of the beams are diagonally cross-strapped, extending to, and fastening with, the hanging-knees, which are on all the yellow pine beams, 3 feet 8 inches apart, and fastened to every beam with a wood screw-bolt, 22 inches apart, and originally *designed* to be riveted (but not yet done) at the crossings, to prevent torsion, a subject seldom thought of in constructing very sharp vessels. The decks are of white pine, 2½ in. thick. The outside planks are of yellow pine, 4 inch bottom, 5 inch wales, extending within 3½ feet of second

deck; from thence to the outside clamp, or sheer-strake, the outside is white pine, $2\frac{1}{4}$ inches thick; the sheer-strake is $4\frac{1}{2}$ inches thick; the planking is tapered from its full thickness to $2\frac{1}{4}$ and $2\frac{1}{2}$ at rabbets. The entire bottom chimes in fair lines from aft edge of post to forward edge of stem, so that these parts are parts of the model of the vessel. The extreme length on the 10 feet line of flotation is 222 feet 10 inches; on the deck we have referred to, the extreme length is 230 feet; her extreme breadth is 36 feet ten inches; her depth *was* 16 feet 3 inches. Her engine is the vertical beam, 65 inch cylinder, 12 feet stroke, cutting off at $\frac{5}{8}$ on the down, and $\frac{3}{4}$ on the upper half of the stroke. Her wheels are 33 feet diameter, with 4 feet 10 inches dip, at 10 feet draught of water. She was designed to have 36 feet diameter of wheel, with 5 feet dip, and 72 inch cylinder, and 8 feet to 8 feet 6 inches draught of water; weight of hull, $397\frac{1}{2}$ tons; engine, 300 tons; coal, 400 tons; outfit and furniture, 18 tons; water, passengers and provisions, 20 tons—total, $1{,}135\frac{1}{2}$ tons; displacement of vessel, 1,137 tons; and would have been the strongest, safest and fastest wooden vessel ever yet built, as well as the most *profitable* in the hands of enterprising managers.

SKIDDY'S PATENT CAPSTAN.

We give place to the following letter from the commander of the Steamship Washington to Capt. Wm. Skiddy, with much pleasure. This capstan has but recently been fitted on board the Washington. We believe most of the new steamers and ships out of this port have adopted Skiddy's Patent Capstan. It is a sufficient guarantee of its utility and worth that Capt. Skiddy has accepted its agency in the United States, being a London invention, and recommends it to the public. An engraving of it will be found on the cover.

STEAMSHIP WASHINGTON, NEW-YORK, June 12.

Dear Sir:—Having no occasion to anchor after fitting your Patent Capstan and Stoppers until we arrived at Cowes, I take pleasure in giving you an account of the performance.

We let go the anchor without a range on deck, the ship taking the chain out of the locker as we wanted it. With thirty fathoms out, we hove up in twelve (12) minutes, which heretofore occupied at least half an hour. We had twenty-five men on the bars, but they were in each other's way; fifteen could have done the work.

I approve of the whole arrangement. The anchor is always ready for letting go, without hauling up a range, and in heaving up, requiring no person to hold on, the cable paying itself down below; and I highly recommend the Patent Capstan and Stoppers, (THOS. BROWN'S) to all ships. I am, sir,

Yours, &c.,

Capt. WM. SKIDDY. E. CAVENDY, Commander.

MODELS AT THE PARIS EXHIBITION.

OUR Paris Correspondent informs us that in the American Department, Nautical Mechanism has not been forgotten. There are several models of war-vessels, among others one of a vessel well adapted to service, either before Cronstadt or on the southern coast of the United States, as the dimensions and calculations will show. This model went from the office of the NAUTICAL MAGAZINE, made to the order of Mr. Thomas Maskell, Commissioner to the exhibition from Louisiana. The model is intended to represent a corvette, pierced for 8 guns of 8 inch bore, carrying shot of 69.8892 pounds weight, fitted with Maskell's Slide Keel, to draw but 7 feet water; representing a class of vessels much needed, both in the Navy of the United States as well as that of England and France.

The following are the dimensions and calculations:

Length of load line, 6 feet above base,		194.75 ft.
Breadth moulded,		50.25
" extreme,		51.00
Centre of gravity, aft of middle of load line,		2.89
Area of load line, sq. ft.	6867.38	
Greatest transverse section, aft of middle of load line,		6.55
Moulded displacement in cubic feet,	31427.75	
Entire " outside of plank,	33391.88	
" " in tons,	955.05	
Exponent of capacity,	0.53	
Centre of gravity of displacement below load line,		1.87
" " " aft of mid length,		3.97

Notwithstanding the extreme light draught of water, this vessel, if built, would carry a battery as high as any corvette, and sail faster than any vessel now afloat belonging to the Navy, carrying an ample supply of ammunition, provisions, and men.

For the Nautical Magazine.

TRUSS-WORK KEELSONS.

The freight steamboats on the Western and Southern rivers depend entirely for their strength on a truss-work in the hold, reaching from the floor timbers to the deck beams, fore and aft; otherwise they are very slightly built, and, at best, cannot hold together more than four or five years. This truss-work consists of 4 by 6 oak, diagonally placed, crossed and mitred, about two feet apart, the spaces between which are sufficient for a man to crawl through; forming, in effect, a keelson, or backbone, which supports the enormous weight of machinery and cargo.

It strikes me that something of the same kind might be adapted in the construction of our large sailing ships. A truss-work in the lower hold would take up no more room than stanchions, and would always be equal to shifting boards. Division of the hatches into two parts would be no inconvenience, as, practically, the starboard and larboard sides of the lower hold are separated now by the necessity of keeping trim, &c., in loading and discharging; a staple cut through the mast, below the wedges, would not essentially injure its strength, or some other contrivance might evade this difficulty.

So long as the keel keeps its straightness, the vessel can scarcely alter her shape; but it is notorious that every, even the strongest built vessel, does crook the keel and alter her shape after leaving the stocks, and the tendency to hog increases as she grows older.

When a ship is stranded, the first part which gives way is the keel and keelson, the lifting up of which amidships carries the floor timbers with it and breaks the frame at the turn of the bilge, which is the weakest part of the vessel—where she separates in going to pieces. Now, iron truss-work on the frame ends, just at this weakest part, and without the return strength of the backbone, would evidently increase the tendency to break the frame at the bilge; therefore a truss-work at the centre is better than at the sides, and, for its material, wood is better than iron,* as experience has proved in hanging-knees.

As to the form of the keel, the slight allowance usually made when laid for arching, when afloat, might be very much increased with advantage. Whatever opinions there may be about concave or convex water-lines in the model, there can be but one that a concave sheer in the garboard is an injury—a ship in crossing a bar will strike forward and aft, but seldom amidships. She might draw several feet more amidships than forward and aft, without any disadvantage; she would hold on better, ware and stay quicker, and be less liable to damage the ground tier of cargo.

* We cannot recognize any mechanical analogy between the strain upon truss-work and that upon knees, and do not think our correspondent's preference admissible. Besides, wood would be less durable, more bulky, of greater weight, and less strength than iron, and not so easily confined in place. [Eds.

I observe, lately, in the frames of ships in our yards, a very small proportion of natural crooks, most of the futtocks being cut from straight timber. Heavy bilge strakes cannot make such vessels strong; the greatest strain in carrying sail, as well as getting ashore, coming on their width, and not upon their length or thickness. A. S.

STEAMER ARIEL, OF VANDERBILT'S EUROPEAN LINE.

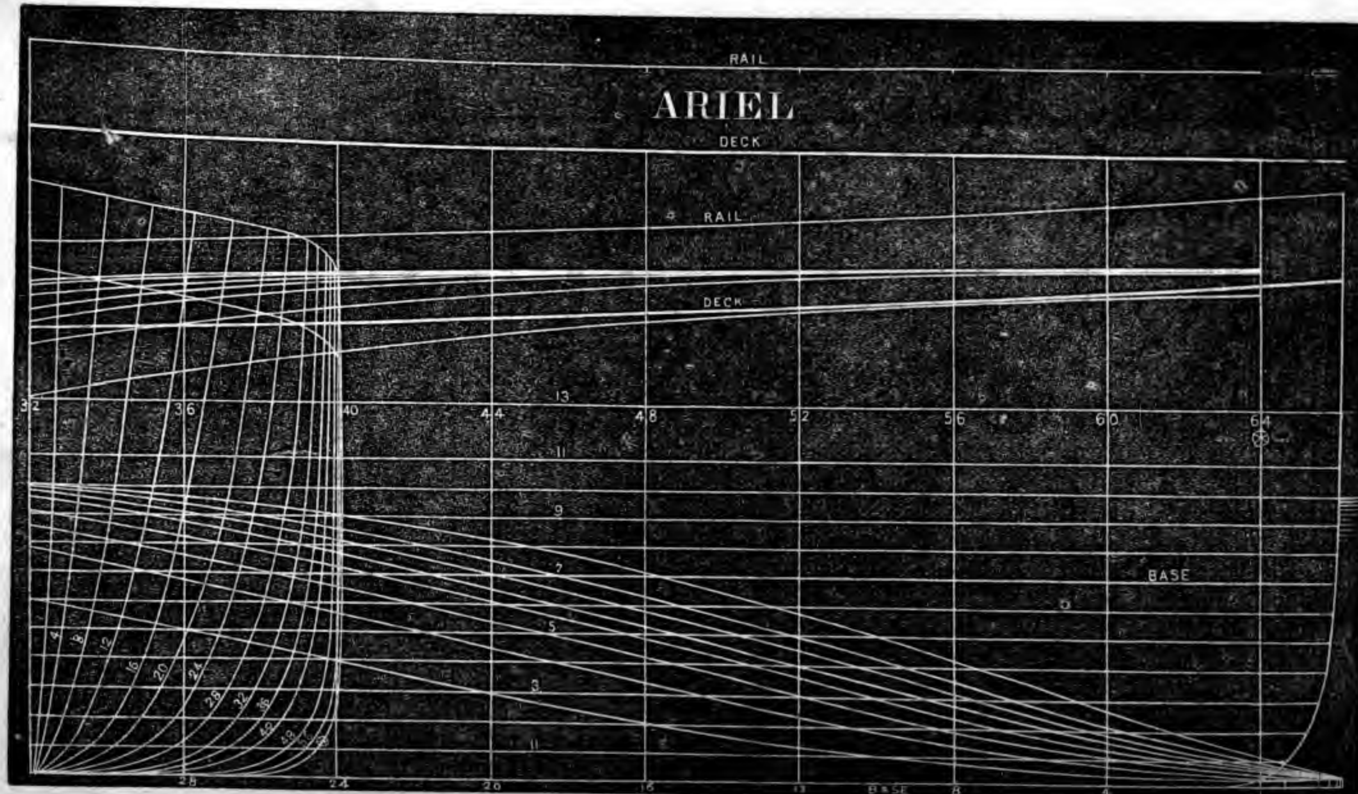
The steamship *Ariel* was built in New-York, by Mr. Jeremiah Simonson, for Cornelius Vanderbilt, Esq., and was launched March 3, 1855. The politeness of her builder and engineers have enabled us to give the draught and the following particulars of this ship.

Her dimensions are as follows:—

	Feet.
Length on the load line	251.
Breadth of beam moulded	32.50
Depth of hold to spar deck	26.
Registered tonnage	1,300 tons.

The keel is sided 14 in., and moulded 13 in. The floors are sided 12 in., and moulded 18 in. at the seat. The frame is moulded 14 in. at the turn of the bilge; thence to the rail it is tapered to 6 in.; being sided 8 in., and the floors filled in solid with white pine. The floors are of white oak; the other parts of frame of hackmatack, locust, and red cedar. The keel and dead woods are of oak. The keelsons consist of two centre courses placed side by side, 19 in. deep. There are four other keelsons each side of centre, and all sided 14 inches. They are of yellow pine capped with oak, and oak. The frame is strapped in the usual diagonal manner, with plate iron $4\frac{1}{2}$ in. wide, by $\frac{6}{8}$ in. thick; one strap being allowed for every frame; and the frames being spaced two feet apart.

The ceiling is of yellow pine, 8 in. thick from outside of keelsons to first deck, thence upwards there are three strakes of waterways 6 in., and ceiling 6 in. thick up to the second deck.

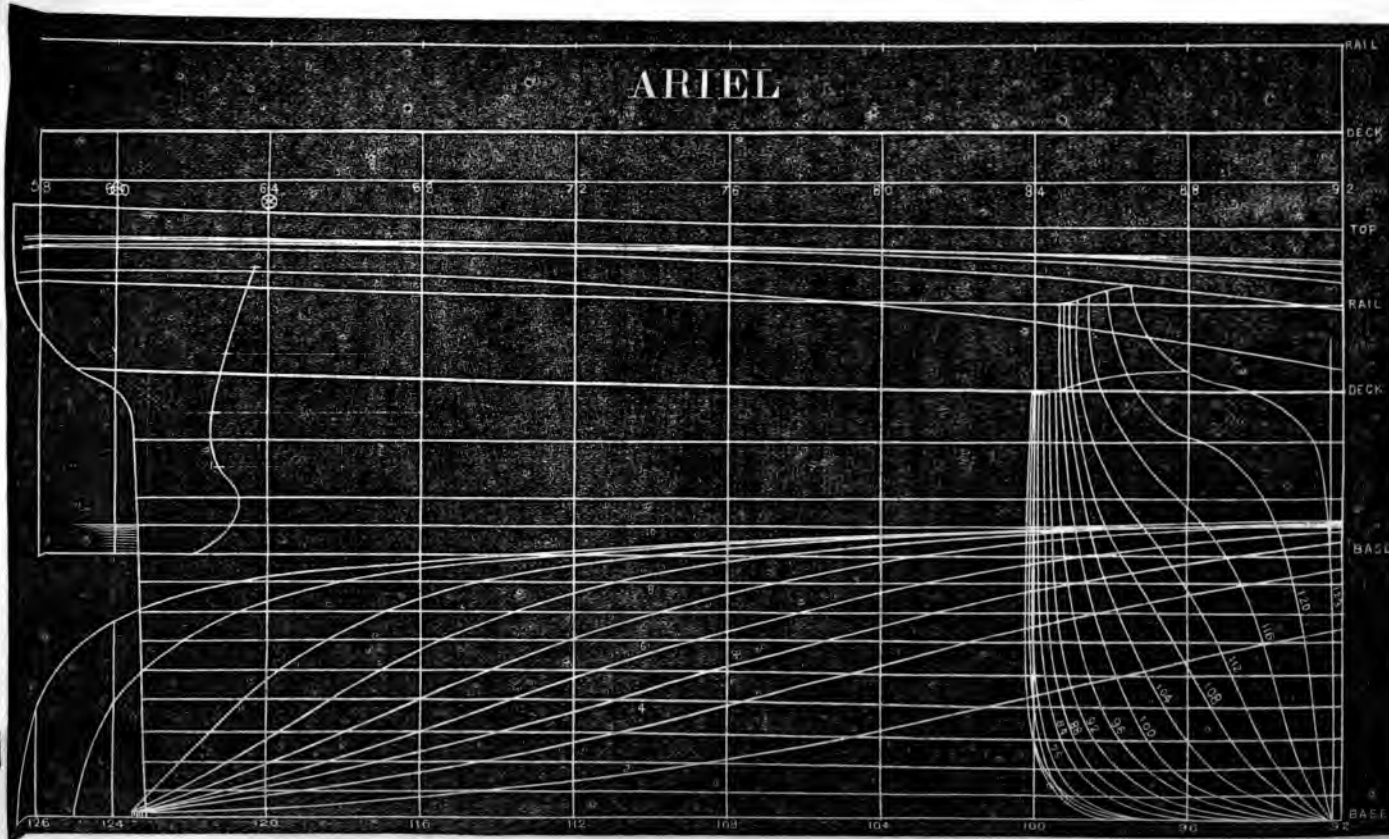

ARIEL
RAIL
DECK
RAIL
DECK
BASE
BASE

The *Ariel* has a spar-deck, seven feet above the second, for the third deck; and has a short deck in the hold at each end of the ship. Above the second deck the ceiling is worked from the waterway, up to the main rail, 3 in. thick; the stanchions are of locust, and the spar-deck is kneed to the same.

The garboards and bottom plank, to bilge, are of oak, $3\frac{1}{2}$ in. thick; thence the plank is 4 in. thick, of yellow pine, to the second deck; thence to the rail 3 in., of white pine; and from the rail to the spar-deck the thickness is $2\frac{1}{2}$ in., also of white pine. The first deck hanging-knees are of oak, sided 10 to 12 in.; second deck hanging-knees, of oak, sided 8 to 9 in.; and the spar-deck hanging-knees are of hackmatack, sided $4\frac{1}{2}$ inches. The first deck lodge and bosom knees are sided 6 in.; those of the second deck are sided 5 in.; and the spar-deck has none. Forward, above second deck, she was ceiled with 3 inch plank, up to the rail, and from the rail to the spar-deck with $2\frac{1}{2}$ inch plank. The rail is 5 in. thick by 15 in. wide. The planks of first and second decks are 3 in. white pine, of spar-deck, $2\frac{1}{2}$ inch. The *Ariel* has no chocks between her timbers, and is square fastened with locust treenails and butt-bolted. The ceiling in the bilge is bolted edgewise at intervals of four feet, and square bolted to every timber. The stem and stern posts are each sided 13 inches.

MACHINERY.

Kind of engine, vertical beam. Kind of boilers, return-flued. Diameter of cylinder, 75 in.; length of stroke, 11 ft.; diameter of wheels over blades, 33 ft.; length of blades, 8 ft.; depth of blades, 18 in.; number, 28; number of boilers, 2; length of boilers, $12\frac{1}{2}$ ft.; diameter of shell of boilers, 11 ft. 2 in.; height of boilers, exclusive of steam-chimney, 11 ft. 8 in.; number of furnaces, 3 in each boiler; length of fire-bars, $7\frac{1}{2}$ ft.; number of upper flues, 6; internal diameter of upper flues, 1 foot $5\frac{1}{4}$ in.; length of ditto, 24 ft.; diameter of chimney, 74 in.; height of ditto, 48 ft.; area of immersed section at load line, 440 square feet; contents of bunkers in tons, 600; draught, 15 ft.; masts, 2; rig, fore-topsail schooner.


ARIEL
RAIL
DECK
TOP
RAIL
DECK
BASE
BASE
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112
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104
100
96
92

CALCULATIONS OF HULL.

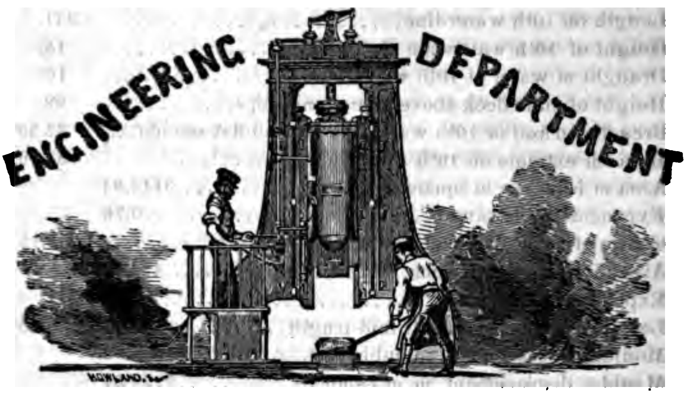
		Feet.
Length on deck		254.
Length on 10th water-line		251.
Height of 10th water-line above base		15.
Draught of water at 10th water-line		16.
Height of main deck above base at midships		22.
Breadth on load or 10th water-line at dead-flat section		32.50
Breadth extreme on 10th water-line		33.16
Area of load-line in square feet	3114.94	
Exponent of the same	0.76	
Centre of gravity of load-line abaft mid-length		5.15
Area of greatest transverse section, in sq. feet	482.70	
Exponent of the same	0.99	
Location of the same abaft mid-length		6.25
Moulded displacement, in cubic feet	78033.99	
Moulded displacement, in gross tons	2229.54	
Entire displacement, in gross tons	2360.69	
Exponent of displacement	0.63	
Centre of gravity of the same below 10th water-line		3.35

Launched 1855—drew 8 ft. water; when ready for a voyage, with 500 tons of coal on board, draws 15 feet.

The *Ariel* forms one of C. Vanderbilt's line between New-York and Havre. Her consorts are the *North-Star*, and the new steamer now on the stocks at Green-Point, to be called the *C. Vanderbilt.*

Destruction of Forests.—The *Scientific American* informs its readers that it requires 2,200 full grown trees, or the matured crop of forty-four acres of timbered land, to furnish timber for a single 74-gun ship. If England had all the timber, of which her seventy-fours are built, back again in the forest, it would be worth quite as much, if not more, to her, than it now is, and would be quite sufficient to build a more formidable fleet than can now be found in the whole world. How many thousand trees are annually destroyed by the *wood butchering propensities of Naval Architects*, both in the Old and New World, in those ill-shapen hulks which drift about the ocean, it would be most difficult to tell.

Errata.—On page 397, third line from top, for "buckets," read "*beckets*."



TONNAGE AND HORSE-POWER,

ALIKE INADEQUATE TO DETERMINE THE SIZE OF THE VESSEL OR THE POWER OF THE ENGINE.

We have for the present been relieved of the immediate necessity of discussing this question, as compounded in the above title, inasmuch as we have recently been put in possession of one of the best papers upon this subject that, perhaps, can be found extant; it having been read before the Royal Society of Arts, London, May 16, 1855, by Charles Atherton, M. Inst., C. E., Chief Engineer of H. M. Dockyard, Woolwich.

We shall give it entire, under the title given by its author, interspersed with such notes as we may deem pertinent.

The Capability for Mercantile Transport Service of Steamships, with reference to the mutual relations of their Tonnage, Displacement, Engine-power, Steaming-speed, Distance to be run without Re-coaling, Tons Weight of Cargo, and the Expense incurred per Ton of Cargo Conveyed.

The object of the following exposition on steam-shipping is to suggest and exemplify some definite process of investigation and arithmetical deduction whereby the capabilities for sea transport service of steamships may be as correctly estimated as is the capability for land transport service of the

railway locomotive engine. Railway capability has already been reduced to a definite process of calculation, while steamship capability has never yet been subjected to arithmetical deduction, simply because the very terms "tonnage" and "horse-power," by which the elementary details of steamship service are designated, are absolutely indefinite. No legislative enactment has hitherto defined the standard unit of quantity that is meant by the tonnage of a ship, as denoting the measure of a ship's capability for transport service, either as respects measurement or weight; or what is meant by "nominal horse-power," as the standard unit of the measure of the amount of force, which a marine engine may be legally required to be capable of exerting. Nevertheless, ships' *tonnage* and marine engine *horse-power* are made the nominal base of mercantile pecuniary contracts to the extent of millions per annum. For example, in the Government Transport Service for the past year, (1854), the amount of shipping employed has been designated at about 210,000 tons tonnage and 26,000 horse-power, involving pecuniary contracts based on the indefinite terms *tonnage* and *horse-power* to the amount of £3,000,000 sterling. In fact, it may be plainly asserted that a contract for the building or hiring of ships, based simply on the nominal tonnage of the ship and the nominal horse-power of the engines, binds the contracting parties as to the sum of money that is to be paid, without affording any definite or specific guarantee, whatever, as to the amount of capability for service that the vessels so purchased or hired will afford.

Such are the circumstances under which, in continuation of the public efforts that I have made since 1850, by publication and otherwise, to expose the anomalies of steam-shipping, I now respectfully call the attention of the Society of Arts to the subject of the capability for goods transport of steamships; and, considering that the Society of Arts is distinguished as the parent of no less than the 350 Associated Institutions devoted to educational cultivation, and to the practical prosecution of all utilitarian pursuits in science and arts, I appeal to the Society, confident in the expectation that any effort to direct attention to the fundamental basis of steamship capability—namely, "tonnage" and "power"—as standard units of admeasurement, in such manner as to construct thereon some system of transport £ s. d. *arithmetic* will not fail of being countenanced by the Society, and promulgated for the consideration of its numerous associated correspondents, with a view to its being matured and rendered practically useful.

In the prosecution of this inquiry, the course which I propose to follow demands that I solicit the indulgence of the members of this Society; because, in the first place, I shall have to dwell on matters purely rudimentary; and the statistical character of the inquiry is suited rather for private study than for open dissertation; also, in the desire to be specific, repetitions will frequently occur. Thus, claiming your indulgence, I propose to direct attention to the following points for consideration:

1st. What is the builder's tonnage of a ship? What is the displacement of a ship? And, by reference to examples of steamship construction, to

show that these two terms have practically no approximate ratio whatever to each other.

2d. What is the nominal horse-power of a marine engine? What is the working power of a marine engine? And, by reference to examples of marine engine construction and practice, to show that these terms have no approximate ratio to each other.

3d. To illustrate, by examples of steamship construction, the ratio of tonnage to nominal horse-power; which ratio is popularly regarded as expressing the efficiency of a steam-ship, as compared with the ratio of displacement to working horse-power, on which the locomotion of steamships is really dependent.

4th. To determine and define the measure of the unit of power which we assign to the term "horse-power," and also the unit of measure which we assign to the term "ton of displacement," as the fundamental basis of our calculations.

5th. To explain the law of resistance by which the motion of a ship is conventially assumed to be affected, and enunciate the *rule* deduced therefrom, which may be regarded as sufficiently accurate to be practically available for calculating, approximately, the relation of displacement, power, and speed, in vessels of similar types of build, and for comparing the dynamic or locomotive capabilities of different types of build.

6th. To show the extent to which the coefficients of steamship efficiency, resulting from the rule above referred to, differ from each other, thereby exposing the difference of locomotive efficiency between one ship and another.

7th. Assuming any given type of form and any given size of ship, show the mutual relation of speed, distance, and cargo.

8th. To propose a system of arithmetical deduction whereby the cost of upholding and working steamships may be approximately calculated; and, by way of example, assuming a given type of build, and given size of ship, show the mutual relation of speed and £ s. d. prime cost expenses, incurred in the conveyance of goods on a given passage per ton weight of goods conveyed.

9th. To show the extent to which the cost of goods transport is affected by differences in the size of the ships employed, their coefficients of dynamic or locomotive duty, and other constructive data being the same.

10th. Assuming a given type of build, show the extent to which the cost of goods transport is affected, according as it may be required to perform the whole passage direct without re-coaling, or to re-coal at certain intermediate stations.

11th. Show the extent to which the prime-cost expense of goods transport per ton weight is affected by differences in the dynamic quality of the ships employed, as measured by the difference of their coefficients of locomotive efficiency.

Recurring, now, to the foregoing divisions of our subject, taken in their order, it may be observed—

Firstly. The builder's tonnage of a ship, still usually adhered to, though now denominated as the old measurement, is determined as follows:—

Rule. From the length of the ship (measured between the perpendiculars of stem and stern in feet) take three-fifths of the beam; multiply by the beam, and by half the beam, and divide by 94: the result is the builder's tonnage.

For example, take H. M. steam-vessels Fairy and Bruiser. Fairy, length, 144 feet 8 inches; breadth, 21 feet 1½ inches; tonnage, 313. Bruiser, length, 160 feet 6 inches; breadth, 26 feet 6 inches; tonnage, 549.

It will thus be observed that the tonnage makes no specific reference either to the depth of hold or to the draught of a ship.

The displacement of a ship is the cubical measurement of the quantity of water displaced by the hull of the ship, and, when immersed down to the constructor's deep-draught line, it is called the load displacement. The measurement is easily taken from the builder's drawing, showing the lines of the ship, and is dependent not only on the length, breadth, and draught of the ship, but also on the contour of the lines, whether it be full or sharp. The cubical measurement being thus ascertained, the weight of water displaced is readily deduced therefrom, at the rate of 36 cubic feet of water to the ton weight, which will be exactly equal to the weight of the floating mass. Occasionally, builders supply the owners of ships with a statement termed *Scale of Displacement,* showing the weight of the water displaced by the hull of the ship, and therefore the weight of the floating body and its load as it becomes gradually immersed down to the constructor's deep draught-line. For example: displacement of the Fairy, at the constructor's deep draught of 5 feet, is 176 tons' weight. Bruiser, at 14 feet, is 1,013 tons' weight. Hence, by again referring to the statement of tonnage, it appears that, in the Fairy, the ratio of tonnage to displacement is in the proportion of 313 to 176: that is, each 100 tons of tonnage, builder's measure, gives 56 tons weight of displacement; but, in the case of the Bruiser, the ratio of tonnage to the displacement is in the proportion of 540 to 1,013; that is, each 100 tons of tonnage, builder's measure, gives 188 tons weight of displacement.

Thus, it appears that two ships on the respective types of the Fairy and the Bruiser may be of precisely the same builder's tonnage, say 1,000 tons; but the displacement of the one will be 560 tons, and of the other 1,880 tons; and supposing the weight of the respective ships and their machinery and equipment, when ready for cargo, to appropriate one-half of their respective displacements, the one ship will carry 280 tons of cargo only, while the other will carry 940 tons; that is, the one will carry only one-third the cargo of the other, though both ships are of the same builder's tonnage— viz., 1,000 tons. Hence, it appears that the builder's tonnage of ships affords no approximate indication whatever, either of the ship's displace-

ment or of the tons weight of cargo that the ship will carry; and, in like manner, since no notice is taken of the depth of hold, the builder's tonnage affords no certain indication of the capacity of the ship for cargo. This latter defect is approximately corrected by the new measurement of tonnage. But still the new mode of measurement takes no cognizance of displacement; and, therefore, affords no guarantee of the tons weight the ship will carry when immersed down to the constructor's deep-draught line.

Secondly, as regards horse-power. The nominal horse-power of marine engines has hitherto been determined by a rule which originally may have duly represented the then general practice of steam-engine construction, and the rule was as follows:

Assume the effective pressure on the piston at 7 lbs. per square inch, after making all deductions for imperfection of vacuum, friction, and other drawbacks; next, *assume* that the working speed of the piston is at a given rate, according to a certain specified and tabulated rate of speed dependent on the length of stroke; assume 33,000 lbs. raised 1 foot high per minute as the measure of the unit of power to be denoted by the term horse-power; then, multiply the area of the piston expressed in square inches by the assumed effective pressure on the piston, (7 lbs.); and again, multiply by the speed assigned to the piston expressed in feet per minute according to the length of stroke: the product is assumed to give the total amount of moving power expressed in pounds raised 1 foot high per minute, which divide by 33,000, the result is the nominal horse-power. For example:

H. M. S. Terrible, 4 cylinders, 72 inches diameter, 8 feet stroke, at 240 feet per minute, 829 nominal horse-power, called 800.

H. M. S. Banshee, 2 cylinders, 72⅓ inches diameter, 5 feet stroke, at 210 feet per minute, 364 nominal horse-power, called 350.

H. M. S. Elfin, 2 cylinders, 26⅝ inches diameter, 2 feet 6 inches stroke, at 170 feet per minute, 40 nominal horse-power.

In calculating the nominal power of screw-propeller engines, it has become necessary to give the engines credit for the speed of piston actually attained, instead of the tabular speed. But this practice in not enforced by any conventional rule, nor is it invariably adopted; and the distinction thus partially introduced between the paddle-wheel engines and screw-propeller engines only adds to the confusion. Hence, the nominal horse-power is based on assumption, not on fact; and by the only recognised rule for calculating power, no notice is taken of the boiler, on which everything depends.

The working horse-power, usually denominated the *indicated* horse-power, (because ascertained by means of an instrument called the indicator), is measured as follows:

Ascertain, by means of the indicator, the *actual* pressure of steam per square inch on one side of the piston, and the *actual* condition of the partial vacuum on the other side of the piston; these together will give the gross pressure per square inch exerted by the piston. Multiply the area of the

piston expressed in inches by the *actual* gross pressure per square inch, and again multiply by the *actual* speed at which the piston moves, expressed in feet per minute, and divide by 33,000. The result is the gross indicated horse-power; and it has been laid down by some acknowledged authorities in such matters, that the net effective power of an engine may, as a general rule, be expected to be 25 per cent. below the gross power; that is, if we divide the gross moving power by the divisor 44,000, instead of 33,000, the result will give approximately the net effective horse-power as given out by the engines. For example:—the following statement shows the nominal horse-power, the gross indicated horse-power, and the effective horse-power, of H. M. steamships "Trident," "Retribution," "Caradoc," and "Elfin," as follows, namely:—

"Trident," nominal, 350; gross indicated, 492; effective, taken at 25 per cent. less than the gross indicated, 369.

"Retribution," nominal, 400; gross indicated, 1,012; effective, taken at 25 per cent. less than the gross indicated, 819.

"Caradoc," nominal, 350; gross indicated, 1,600; effective, taken at 25 per cent. less than the gross indicated, 1,200.

"Elfin," nominal, 40; gross indicated, 244; effective, taken at 25 per cent. less than the gross indicated, 183.

Hence, it appears that in the "Trident" the ratio of the nominal horse-power to the effective horse-power has been 350 to 369; that is, each 100 nominal horse-power has worked up to 105 effective horse-power.

In the case of the "Retribution," the ratio of nominal horse-power to the effective horse-power has been 400 to 819; that is, each 100 nominal horse-power has worked up to 205 effective horse-power.

In the case of the "Caradoc," the ratio of nominal horse-power to the effective horse-power has been 350 to 1,200; that is, each 100 nominal horse-power has worked up to 343 effective horse-power.

In the case of the "Elfin," the ratio of nominal horse-power to the effective horse-power has been 40 to 183; that is, each 100 nominal horse-power has worked up to 457 effective horse-power.

Thus, it appears that four different sets of marine engines may be of the same nominal power, say 100 nominal horse-power; but, nevertheless, their effective powers may be 105, 205, 343, and 457; that is, very nearly in proportion to the numbers 1, 2, 3, 4: that is, the unit of nominal horse-power of the "Trident" is one-half that of the "Retribution," one-third that of the "Caradoc," and one-fourth that of the "Elfin." In other words, the nominal power of a marine engine, though contracted for as a definite quantity, say 100 horse-power, affords no guarantee, not even approximately, of the effective power of the engines to be delivered under the contract.

Thirdly. Such being the anomalies as respects the nominal size of ships expressed by tonnage with reference to their really effective size expressed by displacement, and such being the anomalies as to the nominal power of

marine engines with reference to their effective power, it is evident that the ratio of nominal horse-power to tonnage, which is usually quoted as expressing the mechanical efficiency of a steamship, is a delusion, in so far that both terms are mere fictions, affording no certain indication of the comparison between the means really employed—namely, the effective horse-power with reference to any definite unit, and the service really performed—namely, the displacement in tons weight actually moved at such speed as may be; to illustrate which, I will refer to a few ships which are nominally powered very nearly alike—that is, in the ratio of about 100 tons of tonnage to 40 horse-power, or 2½ tons of tonnage per nominal horse-power. For example:

Vessels.	Builder's Tonnage.	Nominal Power.	Ratio of Builders Tonnage to Nominal Power.
H. M. steamship Encounter	953	360	100 to 38
" Conflict	1,038	400	100 to 38
" Termagant	1,547	620	100 to 40
" Niger	1,072	400	100 to 38
" Sharpshooter	503	200	100 to 40
" Undine	290	110	100 to 38
" Fairy	313	128	100 to 41
" Garland	295	120	100 to 41
" Violet	298	120	100 to 40
" Elfin	98	40	100 to 41

Thus, the above-named vessels are nominally powered very nearly alike, namely, about 40 nominal horse-power to 100 tons of tonnage; but in reality, as determined by their actual displacement and their measured working-power, these same vessels are effectively powered as follows:

Vessels.	Displacement. Tons weight.	Effective Horse-power, based on Indicator Measurement.	Ratio of Displacement to Effective Power.
Encounter	1,482	505	100 to 34
Conflict	1,628	583	100 to 35
Termagant	2,312	988	100 to 43
Niger	1,454	690	100 to 47
Sharpshooter	620	306	100 to 50
Undine	250	331	100 to 132
Fairy	177	273	100 to 154
Garland	250	376	100 to 182
Violet	250	434	100 to 177
Elfin	65	183	100 to 281

Hence, it appears that although the before-mentioned steamships are nominally powered alike, namely, in the ratio of 40 horse-power to 100 tons of builder's tonnage, and are officially rated as such, the absolute proportions of effective power to tons of displacement in these identical vessels actually fluctuate from 34 horse-power up to 280 horse-power for each 100 tons of displacement. Nevertheless, the locomotive efficiency of steamers

is publicly recognised, even by the Board of Trade Mercantile Navy List, as being represented by the ratio of their tonnage to their nominal horse-power, and no cognizance whatever is taken of the displacement of ships at the constructor's load-line draught, or of the available effective power of the engines with reference to any definite unit of motive power. The delusion is recorded and published as fact; the truth is altogether disregarded. Is it possible that the service of steamships can be effectively conducted under such a system of uncertainty and delusion in regard to their respective capabilities?

Fourthly. We now come to treat of the dynamic or locomotive operation of steamships; and since it is the engine-power that causes a steamship to move, and the tons weight of displacement moved at such rate of speed as may be, that constitutes the effect produced, it becomes utterly impossible to treat of and discuss the subject of steamship locomotion without defining, in the first place, what shall be the measure of the unit of power which we denominate as marine horse-power. We have already referred to the nominal horse-power as being calculated on assumed limitations, which are no longer recognized in marine-engine practice, and are therefore a mere fiction; but we have referred to the gross indicated power as a reality, in so far that it is an actually measured quantity, based on the definite standard of 33,000 lbs raised one foot high per minute; and the gross measure, as exerted by the piston of an engine, has been, by tacit concurrence, converted into net or effective working power of the unit above referred to, by the assumption that friction and various other causes of detriment, not definitely measurable, may be fairly expected to obstruct the action of an engine to the extent of 25 per cent.; that is, in order to obtain effective horse-power of the unit 33,000 lbs. raised 1 foot per minute, the gross indicated force exerted by the piston, as measured by aid of the indicator, and described in lbs. weight raised 1 foot high per minute, must be divided by the divisor 44,000, in order to give effective horse-power of the unit 33,000 lbs. raised 1 foot high per minute. But even this measure of the effective unit of power of marine engines has been altogether superseded in modern marine-engine practice, and no definite measure has been, by common consent or by legal enactment, substituted in its place. For example, referring to an essay recently published by myself, on steamship capability, page 5, it appears that the engines of ten steam-vessels lately employed by the government as mail-packets, namely, "Banshee," "Llewellyn," "Caradoc," "Vivid," "Garland," "Violet," "Onyx," "Princess Alice," "Undine," and "Elfin," were contracted for and supplied to government as amounting in the aggregate to 1,840 nominal horse-power; but the measured gross indicated power capable of being exerted by these engines actually amounted to a power equivalent to 285,758,000 lbs. raised 1 foot per minute; which, divided by 1840, gives 155,303 lbs. raised 1 foot high per minute, as the gross measure of the unit of marine horse-power thus actually delivered under the denomination, nominal horse-power. In

consideration, however, that the contractor's supplied engines for the mail-packet service exerting an amount of power undoubtedly above the ordinary practice of trade, and considering further that the working power exacted from these mail-packets on the occasions of the proof trials by which the efficiency of the engines was tested, may have been forced beyond the limits of ordinary work, I have allowed 15 per cent. for this excess, and assumed 132,000 lbs. raised 1 foot high per minute as the gross indicated measure of the unit of power which may be expected to constitute a marine horse-power, and on which I have based my calculations in the essay above referred to. It may, however, be observed, that the commercial result of such calculations is not affected by the measure of power that may be fixed upon as the standard unit of marine horse-power, whether it be 33,000 lbs. raised 1 foot high per minute, or 44,000 lbs., or 100,000 lbs., or 132,000 lbs., or 155,000 lbs., or any other number; for, in proportion as the measure of the unit may be increased or diminished, so will the number of such units be the less or greater to perform a given service; but, for the purposes of arithmetical calculation as to the comparative economy of different ships, it is evidently indispensable that *some definite measure of power be fixed upon as the unit of power*, and that the same measure of the unit be applied to all. In the following calculations, therefore, the unit of the gross marine horse-power as exerted by the piston of an engine will be regarded as equivalent to 132,000 lbs. raised 1 foot high per minute; and we shall regard the constructor's load-line displacement in ton's weight, at the rate of 36* cubic feet of water to the ton, as expressing the size of a ship on which we base our calculations; observing, however, that this measurement will not represent, or be any certain indication of, the entire capacity of the ship with reference to roomage for measurement goods. Equity requires that the builder be paid with reference to size or roomage, as one element of the building cost; but science requires that the work performed by a steamship be ascertained with reference to the tons weight as measured by the ship's displacement, combined with the speed at which the ship may be propelled.†

Fifthly. Our next step must be to determine the formula or "rule," whereby the law of resistance, as expressed by the mutual relations of displacement, power, and speed, in vessels of similar form, worked by engines of corresponding efficiency, may be most satisfactorily represented. The writer of this paper, referring to the labors of others on this subject, and without impugning their conclusions, has been practically brought to the opinion that theoretical investigations in search of the form of vessel that shall give the greatest locomotive effect with a given amount of power,

* 34.7826 cubic feet = 1 ton of displacement. 35 is nearer.

† Weight and displacement are synonymous: capacity and cavity are equally so. The former should be expressed in tons; the latter in cubic feet. [EDS. N. M.

generally result in mathematical complications of too abstruse a character to be practicably available; and that the theoretical deductions which may be thus arrived at would, after all, require experimental confirmation before being taken for granted. Our object is, to determine what ships actually do; not what they theoretically ought to do. It is, therefore, presumed to be only by the result of actual experience, not of mere models of ships, but of ships themselves, that the type of form best adapted for locomotive duty will be ascertained. By adopting this principle of practical trial, though we may not arrive at perfection, we may obviate unheeded retrogression, which has hitherto been the bane of steamship constructive progress; and by taking the chance of occasionally getting a small step in advance of all previous types of build, we shall progress towards the attainment of perfection, at which it may never be said that we have absolutely arrived.

This course of procedure, however, evidently demands that we determine upon some standard rule whereby we may assign some definite number as the index number or co-efficient indicative of the dynamic or locomotive efficiency of steamships, such coefficient being based on the data which the trial of the vessel may actually substantiate. Our object now is to fix the formula or "rule" by which this "co-efficient" of locomotive duty shall be calculated. I believe it to be generally admitted that, for all practical purposes, though not strictly correct, the velocity (V) of a steam-vessel will vary as the cube root of the effective power, or as the cube root of the gross indicated power, provided that the effective and gross indicated powers be in a constant ratio to each other; or, in any given vessel the power will vary as the cube of the velocity (V^3) provided the displacement be constant, and friction evanescent. Also, if the speed be constant, the friction evanescent, and the types of form of the immersed hulls be perfectly similar to each other, though different in size or displacement, the resistance at any given speed, and the power to overcome that resistance, will vary as to the maximum cross section (A). Hence, for *similar types of form*, the friction being supposed to be evanescent, we have $\frac{V^3 \times A}{\text{H. P.}} = C$, C being some constant number for vessels of similar type of form, and of equal mechanical efficiency. But this formula is not adapted for calculations which involve the weights of the ship and cargo. We must, therefore, convert it into a form embracing displacement. Now, in similar types of form, the lengths, breadths, and draughts of one vessel will be in the same degree proportional to the length, breadth, and draught of another, and the maximum cross section (A) will vary as the square of either one of the analogous dimensions (a^2), whilst the whole cubical dimensions of the immersed hull or displacement (D) will vary as the cube of the same dimension (a^3), or A will vary as the cube root of D, and therefore a^2 will vary as $D^{\frac{2}{3}}$; but a^2 also varies as the maximum sectional area (A); consequently the maximum sectional area (A) varies as the cube root of the

consideration, however, that the contractor's su
mail-packet service exerting an amount of pow
ordinary practice of trade, and considering fur
exacted from these mail-packets on the
which the efficiency of the engines was
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vessels of a similar ...cy, $\frac{V^2 \times D^{2/3}}{H.\ P.}$ will be ...s be of dissimilar types of ...ne coefficient (C) will not ne... ...ypes of form and differences of ...nces in a different degree, and that ...thereto will be the best adapted for lo... ...rial of the ship, shall produce the highest ...engines be equally effective as respects the ...power to the net effective power, whereby the ...and which may be tested by means of the dyna...

...motive efficiency of a steamship, let the vessel be ...runs over a given distance; let the displacement of the ...draught be accurately measured; also, let the gross power ...means of the indicator, and the corresponding speed, either ...statute miles per hour, be ascertained; then observe the fol... ...multiply the cube of the velocity (V^3) by the cube root of the ...displacement ($D^{2/3}$), and divide by the gross horse-power: ...will be the numeral coefficient (C), which denotes the locomo... ...ciency of the ship, or, in other words, the constructive merit of the ...form combined with engine adaptation thereto.

...comparative efficiency of the engine department alone is to be ...ined, it may be effected approximately by working the engines at ...ings, and ascertaining the ratio between the effective power as deter... ...d by the dynamometer and the gross power as determined by aid of ...indicator, and at the same time taking the consumption of coal per ...r with reference to the gross indicated power; and if the comparative efficiency of different types of form be required irrespective of the engine department, then the net effective horse-power must be determined by the aid of the dynamometer, and substituted in the above-mentioned formula for the gross indicated horse-power.

Sixthly. Assuming the rule—multiply the cube of the velocity (V^3) by the cube root of the square of the displacement ($D^{2/3}$), and divide by the horse-power (H.P.) as producing a numeral coefficient or index number approximately indicative of the relative constructive merits of vessels as respects their types of form and engine adaptation thereto, I will now give a few examples of the application of the rule, showing the great difference that exists between one ship and another as respects their locomotive or dynamic efficiency; thence inferring the necessity which exists for such test trials of ships being more commonly had recourse to, as the most available means of *checking retrogression*, and duly maintaining in new ships our already realized advancement in the art of steamship construction:

	isplacement ıs Weight.	Gross Indicated Power. (Ind. H. P.)	Marine Horse-Power. H. P.	Speed per hour. Knots.	Index Number or Coefficient of Locomotive Performance.
	[illegible]0	1,356	339	12	944
		436	109	9.64	864
		364	91	13.32	792
		793	198	9.6	728
	[illegible]4	623	156	8.3	664
	2,251	1,218	304	10.29	616
	1,323	920	230	10.43	592
..ilict	1,443	777	194	9.29	528
Termagant	2,370	908	227	8.55	492
Dwarf	98	216	54	10.54	460

Thus, the coefficient of locomotive duty of the "Candia" (944*) is about 30 per cent. superior to that of the "Vulcan" (728), and upwards of the double, or 100 per cent. superior to that of the "Dwarf" (460), though the engines of these three vessels were all made by the same manufacturer; the effect of which is, that, supposing two vessels of, say 2,500 tons displacement, of the respective types of form and engine adaptation thereto of the "Candia" and the "Dwarf," the former would be propelled at the speed of 10 knots per hour, by 196 marine horse-power of the unit 132,000 lbs. raised 1 foot high per minute, while the latter would require 400 marine horse-power to be propelled at the same speed.

It must be observed that, in this great difference of locomotive efficiency between the "Candia" and the "Dwarf," there are involved not only the known differences of type of ships' form and difference of engine efficiency, but also probable difference of resistance resulting from difference of friction from the immersed hull being possibly cleaner in one case than in the other; also possible differences of engine management, the one engine probably being screwed up or packed too tight, and the other running free. The difference of the coefficients in the cases referred to, shows that a positive malconstruction, or defective condition, or bad management, or abuse of some kind exists, to the extent of about 100 per cent.; and being thus proved to exist, the cause thereof should be inquired into, detected, and remedied, if remediable; or, possibly, it may be better to condemn an inferior ship, rather than run her at the disadvantage of incurring 100 per cent. extra expenses in the engine department of her service.†

* When there is no weight of the vessel given, there is no means of knowing the dynamic efficiency, inasmuch as it often occurs that two vessels of equal load-line displacement very materially differ in the displacement of their light line of flotation; hence, the excess of weight in the heavy vessel operates against any advantage it may possess in model, and *vice versa.*—[Eds. *Naut. Mag.*

† As the consumption of coals is (*cæteris paribus*) proportional to the gross indicated H. P. actually worked up to, and as the speed is proportional to the dis-

In mercantile steamship navigation, no method whatever of a definite description, such as that above described, has ever been adopted for testing the capability, condition, and management of steamships. The sacrifice of national interests, from vessels being ill-adapted for the most economical performance of the service required of them, is, probably, enormous, and, in my opinion, attributable to no specific quantities having been assigned to the terms *tonnage* and *horse-power* as standard unit measures applied to steam-shipping. This deficiency in legislation requires correction, for, without such correction, inquisitorial arithmetic, as applied to steam navigation, can have no sound fundamental starting-point; and the Society of Arts, more appropriately than any other, may undertake the task of effecting so desirable and so important a reform.

Seventhly. Presuming that the foregoing rule be admitted as representing, with sufficient accuracy for practical purposes, the mutual relations of displacement, power, and speed, in vessels of homologous construction; and that the numeral value of the coefficient or index number (C) be determined for a whole class of vessels of similar type by the actual test trials of any particular ship, we thus have the means of arithmetically developing the mutual relations of displacement, power, and speed, for all vessels of that constructive type. And I now proceed to develop, in the first place, the mutual relation of speed and power, assuming the size of the vessel at 1,500 tons displacement, and that, on test trial, the engines working at 240 horse-power, gave 12 knots per hour, whereby the coefficient of locomotive efficiency would be 944, the unit of power being taken at 132,000 lbs. raised 1 foot high per minute. In this case, the horse-power required for propelling a vessel of 1,500 tons displacement at variations of speed from 6 knots per hour up to 20,* would be as follows:—6 knots, 30-horse power;

tance divided by the time of passage, the locomotive performance of steamships may be comparatively tested by the following rule:—Divide the distance steamed (taken in nautical miles) by the steaming time, taken in hours; cube the quotient; multiply by the cube root of the square of the mid-passage displacement, and divide by the average 24 hours' consumption of coals expressed in cwts. The result will be the index number, or co-efficient, indicative of the locomotive performance of the steamship. By this rule, the economic operation of the boiler becomes included, and all reference to horse-power being obviated, the elements of this calculation are matters of ordinary counting-house record; and we thus obtain a mercantile rule, divested of engineering technicalities, for comparing the locomotive capabilities of steam-ships.

* There is an adapted speed to every shape of vessel. Hence it follows that the locomotive efficiency of vessels cannot be determined, as a basis of reliable data, at other gradations of speed than those for which the model of the vessel peculiarly adapts it. It is quite apparent that the "Arrogant" performed better than the "Candia," at her adapted speed—power considered. This, however, would not have been the case, had she been brought up to the speed of the "Candia."—Editors *Nautical Magazine.*

7 knots, 48; 8 knots, 71; 9 knots, 101; 10 knots, 139; 11 knots, 185; 12 knots, 240; 13 knots, 305; 14 knots, 381; 15 knots, 468; 16 knots, 569; 17 knots, 682; 18 knots, 809; 19 knots, 952; 20 knots, 1,110.

Thus it appears that to increase the speed of the ship 1 knot per hour from 8 knots to 9, requires that the power be increased from 71 to 101 horse-power, being an increase of 30 horse-power; but to accelerate the speed 1 knot, from 16 knots to 17, requires that the power be increased from 569 horse-power to 682 horse-power, being an increase of 113 horse-power, being four times the power required for the 1 knot increase from 8 knots to 9; and if we would double the speed of a steamship of given displacement, say from 8 knots to 16, we must increase the power from 71 horse-power to 569 horse-power, being 8 times the power; and as this increase of power must be effected without increasing the deep-draught displacement of the ship, the weight of remunerating cargo will be reduced by an amount equal to the increased weight of machinery, and the increased quantity of coal that will now be required for the passage on which the ships may be employed.

Further, in order to show the capabilities of this ship of 1,500 tons of displacement on the type of the "Candia," with reference to the conveyance of cargo on a given passage, say for 3,000 nautical miles without re-coaling, we must assign some definite limit to the weight of coal consumed per hour per horse-power; and since, in my own experience, I am not aware of any steamship service fitted with condensing marine-engines, as now generally in use, having been permanently prosecuted with a less consumption of fuel than at the rate of 4½ lbs. per indicated horse-power per hour, which is 18 lbs. per hour per marine horse-power of the unit 132,000 lbs. raised 1 foot high per minute, therefore, I assume the consumption of coal at that rate, also the weight of the machinery and engine equipment is taken at 5 cwts. per indicated horse-power, or 1 ton per marine horse-power of the unit 132,000 lbs. raised 1 foot high per minute, and the weight of the hull and its equipment complete, exclusive of the engine department, being supposed to appropriate 40 per cent. of the deep displacement, we have results as follow:

If the vessel of 1,500 tons* deep displacement be powered for steaming at 6 knots per hour, the passage of 3,000 nautical miles without re-coaling would require 125 tons of coal, and there would be 745 tons of displacement available for cargo; the weight of cargo in this case being 49 per cent. of the deep displacement.

But if the vessel be powered for 8 knots an hour, the consumption of

* If the vessel be modelled for 6 knots. We do not hesitate to tell engineers that the shape of the vessel comes first; then the power; and that the required speed should be first secured in the model; and then the most economical mode of overcoming the resistance peculiar to that identical model.—[Eds. *Naut. Mag.*

coals would be 222 tons, and the cargo would be 607 tons; the weight of cargo in this case being 40 per cent. of the deep displacement.

If the vessel be powered for 10 knots per hour, the consumption of coal would be 347 tons, and the cargo would be 414 tons; the weight of cargo in this case being 28 per cent. of the deep displacement.

And if the vessel be powered for 12 knots per hour, the consumption of coal will be 500 tons, and the displacement available for cargo will be 160 tons; the weight of cargo in this case being only 11 per cent. of the deep displacement.

Hence assuming steam-vessels, on the type of the "Candia" and other data, as specified, of 1,500 tons deep displacement, as the size of steamers employed upon a commercial transport service on a passage of 3,000 nautical miles, it appears that if the vessels be fitted for the speed of 6 knots per hour, the displacement available for cargo will be 49 per cent. of the deep displacement; at 8 knots per hour the cargo will be 40 per cent. of the displacement; at 10 knots per hour the cargo will be 28 per cent. of the deep displacement; and at 12 knots per hour, the cargo will be only 11 per cent. of the deep displacement.

Eighthly. The foregoing statement exemplifies the mutual relation of speed and cargo,* as respects the sacrifice of dead-weight of cargo consequent on increasing the rate of speed; but at the same time that cargo is reduced by increased speed, the charges are increased, and, consequently, the commercial sacrifice consequent on increasing the rate of speed will be more comprehensibly demonstrated if by any means we can form an approximate £ s. d. estimate of the prime-cost expenses that attend the steam conveyance of mercantile cargo per ton weight of cargo conveyed.

For the details of such an inquiry I may refer to pages 76 and 77 of the second edition of the Essay on Steamship Capability, before referred to, whereby, including 5 per cent. per annum for interest on investment, 10 per cent. per annum for upholding stock, and 5 per cent. per annum for insurance, the annual working charges in the ship department per ton of displacement (assuming the builder's tonnage and displacement to be equal) amounts to £6 11s 2d., and the annual working charges of the engine department to £7 18s. per indicated horse-power, or £31 12s. per marine horse-power, exclusive of coals; the cost of coals being greatly dependent on the locality of the proposed service and state of the times, requires to be made a distinct item of charge; but for the purpose of exemplifying the proposed system of calculation, I assumed the cost of coal delivered on board ship at 40s. per ton.

For example, on this estimate, the annual prime-cost expenses attending the upholding and working a ship of 1,500 tons deep displacement, fitted

* In one vessel only; for as soon as the model is improved, the formula is worthless.—[Eds. *Naut. Mag.*

with engines of 140 marine horse-power of the unit 132·000 lbs. raised 1 foot high per minute, will, exclusive of coal, amount in the engine department, to £4,424 per annum, and in the ship or hull department to £9,837 per annum, exclusive of coal, harbor, and other local dues, lights, and pilotage; and this annual charge against the ship of £9,837 for the ship department, and £4,424 for the engine department, is absolutely irrespective of the locomotive capability of the ship, or of the service that may be performed by the ship, and on which the earnings of the ship may be dependent. Now, in consideration that a steam-ship may be expected to be at sea only, say 200 days per annum, and that it is only at sea that she does the service which must meet the total annual expenditure, it follows that in the ship department the outlay must be rated at 8d. per day, sea time, per ton of displacement, and the expenses in the engine department at 3s. per horse-power per day, sea time, exclusive of coals, which may be rated at 40s. per ton. For example: On these data, the prime-cost expenses per ton weight of cargo conveyed on a passage of 3,000 miles, by vessels of 1,500 tons deep displacement, fitted for the respective speeds of 6, 8, 10 and 12 knots per hour, and supposing them to be at sea 200 days per annum, and to be fully loaded both out and home, may be estimated as follows:

Passage, 3,000 nautical miles; ship, 1,500 tons deep displacement; coefficient of locomotive efficiency that of the "Candia," or $\frac{V^3 \times D^{\frac{2}{3}}}{H. P.} = 944$. Engine department rated at 3s. per horse-power per day, and coals at 40s. per ton. Shipping department rated at 8d. per ton of deep displacement per day.

Speed in Knots.	Horse-power.	Assumed Weight of Hull.	Engine Department.	Total.	Time.	Coal.	Cargo.	Deep Displacement.	Items of Expense.	£	s.	d.	Expenses per Ton of Cargo £	s.	d.
		Tons.	*Tons.*	*Tons*	*D. H.*	*Tons.*	*Tons.*	*Tons.*							
6	30	600	30	630	20.20	125	745	1500	Coal	0	6	9	1	17	3
									Engine Department	0	2	6			
									Shipping Departm't	1	8	0			
8	71	600	71	671	15.15	222	607	1500	Coal	0	14	8	2	5	11
									Engine Department	0	5	6			
									Shipping Departm't	1	5	9			
10	139	600	139	739	12.12	347	414	1500	Coal	1	13	6	3	16	3
									Engine Department	0	12	7			
									Shipping Departm't	1	10	2			
12	240	600	240	840	10.10	500	160	1500	Coal	6	5	0	11	16	10
									Engine Department	2	6	10			
									Shipping Departm't	3	5	0			

From the above table we observe that, with vessels of 1,500 tons deep displacement employed on a passage of 3,000 nautical miles, the rates of prime-cost expenses per ton of goods consequent on steaming at the speeds of 6, 8, 10 and 12 knots per hour, will be £1 17s. 3d., £2 5s. 11d., £3 16s. 3d., and £11 16s. 10d.; which rates of prime-cost freight charge are nearly in

proportion to the numbers 100, 120, 205, and 638. It is to be observed, that the total expense at 8 knots is about 20 per cent. in excess of the 6 knots speed, while the saving of time is 25 per cent.; consequently, it may be advisable that the steaming capability of steamers should be not less than 8 knots per hour. We must, however, be cautious how we exceed the speed of 8 knots per hour; for, at 10 knots, the prime-cost freight charges under the circumstances of this case, become 70 per cent. in excess of the 8 knots speed; and, at 12 knots, the displacement available for cargo is so reduced that the prime-cost freight charges per ton of cargo become 5 times greater than the expenses incurred at 8 knots.

Ninthly. We may now usefully inquire into the effects that will be produced by increasing the size of the ship. Suppose, therefore, that we employ a ship of double the before-mentioned size, namely, 3,000 tons deep displacement, on the same 3,000 miles passage, and under the same conditions as to consumption of coal and other details of estimate, the results will be as follow:

Passage, 3,000 nautical miles; ship, 3,000 tons deep displacement; coefficient of locomotive efficiency $\frac{V^3 D^{\frac{2}{3}}}{H.P.} = 944.$

Speed in Knots.	Horse-power.	Assumed Weight of Hull.	Assumed Weight of Engine Department.	Assumed Weight of Total.	Time.	Coal.	Cargo.	Deep Displacement.	Items of Expense.	Expenses per Ton of Cargo. Items.	Expenses per Ton of Cargo. Total.
		Tons.	Tons.	Tons.	D. H.	Tons.	Tons.	Tons.		£ s. d.	£ s. d
6	48	1200	48	1248	20.20	200	1552	3000	Coal	0 5 11	1 14 8
									Engines	0 1 11	
									Shipping	1 6 10	
8	113	1200	113	1313	15.15	353	1334	3000	Coal	0 10 7	1 18 0
									Engines	0 4 0	
									Shipping	1 3 5	
10	220	1200	220	1420	12.12	550	1030	3000	Coal	1 1 4	2 13 7
									Engines	0 8 0	
									Shipping	1 4 3	
12	381	1200	381	1581	10.10	794	625	3000	Coal	2 10 10	5 3 3
									Engines	0 19 1	
									Shipping	1 13 4	

From the above table we observe, that with vessels of 3,000 tons deep displacement (being the double of the size before referred to) employed on a passage of 3,000 nautical miles, the rates of prime-cost expenses per ton of goods, consequent on steaming at the speeds of 6, 8, 10 and 12 nautical miles per hour, as compared with the expenses incurred with the 1,500 tons ship, will be as follows, namely:

£1 14s. 8d., £1 18s. 0d., £2 13s. 7d., and £5 3s. 3d., instead of £1 17s. 3d., £2 5s. 11d., £3 16s. 3d., and £11 16s. 10d., being a saving in favor of the large ship of 2s 7d., 7s. 11d., £2 2s. 8d., and £6 13s 7d. per ton of goods conveyed, or equivalent to 7 per cent., 17 per cent., 30 per cent., and 57 per cent., showing the advantage of the increased size according as the speed at which the service may be required to be performed shall be 6, 8,

10, or 12 knots per hour. Thus, we see the advantage of the larger ship in performing a *given service* under the *same conditions* of speed and distance to be run without re-coaling, provided that it be always fully loaded, and that its harbor services of loading and discharging cargo be performed with equal dispatch, and that neither mercantile, or local, or naval difficulties subject the larger ship to inconveniences not affecting the smaller.

Tenthly. On the other hand, however, let us suppose that the smaller ship of 1,500 tons avail itself of re-coaling at ports not accessible to the large ships of 3,000 tons, and that instead of performing the whole passage of 3,000 nautical miles direct without re-coaling, it divides the passage into three stages of 1,000 miles each, re-coaling at the two intermediate stations. Under these conditions, the cost expenses per ton of goods conveyed the whole distance will be as follows:

Passage, 3,000 nautical miles, performed in three stages of 1,000 miles each; ship, 1,500 tons deep displacement; co-efficient = 944.

Horse-power.	Assumed Weight of: Hull.	Engine Department.	Total.	Time per Stage.	Coal per Stage.	Cargo.	Deep Displacement.	Items of Expense.	Expenses per Ton of Cargo: Items per Stage.	Total for Stage of 1,000 N. Miles.	Total for Passage of 3,000 N. Miles.
	Tons.	Tons.	Tons.	D. H.	Tons.	Tons.	Tons.		£ s. d.	£ s. d.	£ s. d.
30	600	30	630	6.23	42	828	1500	Coal	0 2 0	0 11 2	1 13 5
								Engines	0 0 9		
								Shipping	0 8 5		
71	600	71	671	5. 5	74	755	1500	Coal	0 3 11	0 12 3	1 16 10
								Engines	0 1 6		
								Shipping	0 6 10		
139	600	139	739	4. 4	116	645	1500	Coal	0 7 2	0 16 4	2 9 0
								Engines	0 2 8		
								Shipping	0 6 6		
240	600	240	840	311	167	493	1500	Coal	0 13 6	1 5 8	3 17 0
								Engines	0 5 1		
								Shipping	0 7 1		

Thus, by re-coaling at two intermediate stations, the cost expenses per ton of goods conveyed amount to £1 13s. 5d., £1 16s. 10d., £2 9s., and £3 17s., according as the speed is 6 knots per hour, 8, 10, or 12 knots, instead of £1 14s. 8d., £1 18s., £2 13s. 7d., and £5 3s. 3d., the expenses per ton of cargo incurred by the larger ship of 3,000 tons displacement performing the passage of 3,000 miles direct, without re-coaling at any intermediate station. Thus, it appears the advantage resulting from the superior capability of ships of 3,000 tons displacement, over ships of half the size, namely, 1,500 tons displacement, on a passage of 3,000 miles, becomes altogether neutralised, and the scale turned in favor of the smaller ship, simply by her taking advantage of re-coaling at two intermediate ports, thus dividing the passage into three stages, instead of performing the 3,000 miles direct. In fact, it is the judicious adaptation of speed to the pecuniary rate of freight charges that the description of trade between any two ports will bear, and the judicious selection of the size of ships to be employed with reference to the amount of trade in both directions, and to the

coaling stations which may be available, that constitute the very essence of steam-ship direction, on which steamship economy of transport is dependent.

On this point, namely, the relative dynamic or locomotive capabilities of large ships as compared with smaller, I am particularly anxious that I be not misunderstood before the Society of Arts. I do not only acknowledge, but I have also publicly endeavored to demonstrate the superior dynamic or locomotive capabilities of large ships for the performance of any given service under given conditions of steaming speed and distance to be steamed without re-coaling; but what I would desire to inculcate is, that this mechanical, and, consequently, in a dynamic point of view, economic, advantage of large ships, may very soon become sacrificed if, on the strength of magnitude alone we impose on the larger ship the obligation of steaming at a higher rate of speed combined with a greater distance without re-coaling, than we assign to the service of the smaller ship. My views as to the most available size of ships are professionally confined to the *mechanical* consideration of the case. I do not enter upon the mercantile and nautical questions by which, apart from engineering, the comparative advantages of large and smaller ships for any particular service are regulated and limited; but, asserting as I do the superior capabilities of large ships in a dynamic point of view, I would also desire to point out the mechanical limitation of such superior capability, in order that the advantages attendant on size may be realised by vessels having such conditions of service only assigned to them as shall not exceed the limitations which they may be advantageously able to perform.

Eleventhly. The importance of subjecting steamship capability for transport service to the test of pecuniary arithmetical calculation, will be illustrated by our bringing into tabulated juxtaposition the £ s. d. prime-cost expenses that would be incurred by performing a given service, under given conditions, with vessels of given size (say 3,000 tons displacement), but of various locomotive qualities, as indicated by the differences of their dynamic coefficients. For this purpose, I have made a selection of ten different types of construction, whose dynamic coefficients have been determined by the actual test-trial performance of the respective ships, and calculating the £ s. d. prime-cost expenses per ton of goods conveyed by ships of these types of 3,000 tons displacement, on a passage of 3,000 miles, at the speed of eight knots per hour, the results are as follow:

Passage, 3,000 nautical miles; displacement, 3,000 tons; speed, 8 knots per hour. [The purpose of this table is to show the mutual relation between the dynamic co-efficient and the £ s. d. cost of transport, the coal being rated at 40s. per ton, engines at 3s. per day per horse-power, and the shipping at 8d. per day per ton of displacement.]

TYPE OF CONSTRUCTION.	Dynamic (C.) Coefficient.	Speed.	Power.	Weight of Hull and Engines.	Time.	Coal.	Cargo.	Deep Displacement.
		Knots.	*Horses.*	*Tons.*	*D. H.*	*Tons.*	*Tons.*	*Tons.*
Candia	944	8	113	1313	15.15	353	1334	3000
Rattler	862	8	124	1324	15.15	387	1289	3000
Vulcan	728	8	146	1346	15.15	456	1198	3000
Arrogant	664	8	160	1360	15.15	500	1140	3000
Dauntless	616	8	173	1373	15.15	541	1086	3000
Hogue	602	8	177	1377	15.15	553	1070	3000
Conflict	528	8	202	1402	15.15	631	967	3000
Termagant	492	8	216	1416	15.15	675	909	3000
Ajax	364	8	293	1493	15.15	916	591	3000
Amphion	332	8	321	1521	15.15	1003	476	3000

TYPE OF CONSTRUCTION.	ITEMS OF EXPENSE.	Expenses per Ton of Cargo. Items. £ s. d.	Total. £ s. d.
Candia	Coal	0 10 7	1 18 0
	Engines	0 4 0	
	Shipping	1 3 5	
Rattler	Coal	0 12 0	2 0 9
	Engines	0 4 6	
	Shipping	1 4 3	
Vulcan	Coal	0 15 3	2 7 1
	Engines	0 5 9	
	Shipping	1 6 1	
Arrogant	Coal	0 17 7	2 11 7
	Engines	0 6 7	
	Shipping	1 7 5	
Dauntless	Coal	0 19 11	2 16 2
	Engines	0 7 6	
	Shipping	1 8 9	
Hogue	Coal	1 0 8	2 17 7
	Engines	0 7 9	
	Shipping	1 9 2	
Conflict	Coal	1 6 1	3 8 3
	Engines	0 9 10	
	Shipping	1 12 4	
Termagant	Coal	1 9 8	3 15 3
	Engines	0 11 2	
	Shipping	1 14 5	
Ajax	Coal	3 2 0	6 18 2
	Engines	1 3 3	
	Shipping	2 12 11	
Amphion	Coal	4 4 3	9 1 6
	Engines	1 11 7	
	Shipping	3 5 8	

Thus, we see that as the dynamic coefficient varies from that of the type of the "Candia,"* (944), to that of the type of the "Amphion," (332), the prime-cost expenses of goods transport will increase from 1*l.* 18s. to 9*l.* 1s. 6d. per ton of goods conveyed on the service referred to. No doubt many causes may contribute to this great difference of dynamic or locomotive economy; but, whether the cause be inferiority of type of build, inferiority of engine adaptation, defective condition of hull or engines, bad management, or all these causes of inefficiency combined, the result is

* We have learned that large vessels are more profitable than smaller ones, and that of ten vessels, the "Candia is not only the most burdensome, but the least expensive at the highest rate of speed attained, or at her adapted speed—12 knots an hour.—[Eds. *Naut. Mag.*

equally detrimental to the commercial interests concerned in the service of the inferior vessel. And, further, it is to be observed, that the economic advantages of a superior type of build may be sacrificed by an unnecessary weight of materials having been employed in the construction of the ship and engines, thereby encroaching upon the displacement otherwise available for cargo. Hence the advantage of knowing the displacement of a ship at her launching draught, and when fully equipped ready for cargo.

In the case of ships ofwar, the armament and personel and material equipment constitute a constant cargo, which may be called tons weight of "Naval Demonstration;" and it may possibly be said that the type of build of ships of war, with reference to their dynamic efficiency, is of secondary importance to their type of build, with reference to stability, sailing properties, capability for carrying guns at the bow and stern, and other essential naval requirements. Admitting the force of this argument, the question assumes the following form, namely:—In what naval respect are the types of form illustrated by the "Amphion" and the "Ajax" so superior to the types of the "Hogue" and the "Arrogant" as to compensate for the tons weight of "naval demonstration" in the types of the "Amphion" and the "Ajax", being only 15 and 20 per cent. of the displacement of ships on those types of construction under the conditions of the assigned service, while the tons weight of "naval demonstration" afforded by the types of the "Hogue" and the "Arrogant" is 36 per cent. and 38 per cent. of their displacement under the same assigned conditions of service. And again, seeing that the types of the "Rattler" and the "Candia," under the same assigned conditions of service, would carry "naval demonstration" amounting to 43 per cent. and 45 per cent. of their displacement, are we sure that the types of construction of the immersed hull of the "Rattler" and the "Candia" do not admit of being approximately adopted as giving available immersed lines for ships of war? But further, embracing the £ s. d. consideration of the case, "it may fairly be asked in what naval respects is the type of construction of the "Amphion" so superior to the type of the "Vulcan" as to make it practically worth while that the conveyance of "naval demonstration" on board the type of the "Amphion" on a passage of 15 days duration, at 8 knots per hour, should cost £9 1s. 6d. per ton weight, whilst its conveyance by the type of the "Vulcan" is only £2 7s. 1d. per ton weight? What superiority of naval efficiency have we to show for the difference of transport expenses per ton weight of "naval demonstration," which ships of these types under the conditions of service referred to would respectively involve?

In conclusion, it may be hoped that the discussion of these matters before the Society of Arts, and the truths which such discussion may elicit, will lead to public attention being directed to the necessity of legalising some system whereby the gross tons weight of displacement of ships at the constructor's specified deep-load immersion shall be ascertained; also, that the

measure of the unit of power to be denoted by the term horse-power be defined and legalised; and that the records of the Board of Trade embrace the gross tons weight of displacement at the constructor's specified load-line draught, in addition to, and not to supersede, the present record of internal roomage, which latter system of admeasurement may doubtless be necessary for the purposes of fiscal regulation. It is respectfully submitted for the consideration of the Society of Arts, that without some legalised definition of the standard units of ship's measurement and of marine engine-power, by which steamships are hired, bought, and sold, and on which their capabilities are dependent, the transport-service of steam-shipping cannot be subject to regulation, or even be brought within the pale of pecuniary arithmetical calculation.

THE FIST USE OF COAL ON BOARD THE HUDSON RIVER STEAMBOATS.

The use of coal to produce steam on board steamboats in the United States, may be said to mark an important era in the history of steam navigation in this country. The costly and bulky material of wood had long been the only article for fuel, and at length it became very desirable to devise a construction of furnace adapted to the use of coals. This was only accomplished *sixteen* years ago, notwithstanding it had long been anxiously desired by Pennsylvania coal owners, and by steamboat proprietors. It always appears very strange, in after-times, *why* the most vital and important improvements in the construction and navigation of vessels were not sooner proved and adopted. Yet so it is, that the best invention often struggles longest for an introduction to ends of profit and of use. Let it not be forgotten, that hard work and much persuasion have been found necessary to gain the adoption of most *new* contrivances of any substantial value, for promoting the ends of industry and enterprise; and, that in the very constitution of things, *old* ideas war against the *new*, which are obliged to *live down* the dying defences of hoary usages, till the last kick is over.

Years before the secret of successfully using coal had been discovered, abortive attempts to use it had been made on the "*Chancellor Livingston*," running to Providence, the "*Victory*,"

to Hartford, Ct., and the "*Matilda,*" to Fort Lee. In January, 1839, Robert L. and John C. Stevens determined to make another attempt. Hearing that coal was used for fuel in Hoe's Press Factory, they sent their engineer to the factory to make observations.

The engineer found that Mr. Hoe used a fan-blower, and returning to the Messrs. Stevens, he made for their boat, the *Passaic*, a fan-blower copied after the one in Mr. Hoe's establishment. When it was completed, the Messrs. Stevens, concealing their object, made an experimental trip in the *Passaic*, taking along, or rather intending to take, no person beside the engineer and themselves. But an incident occurred, illustrating how genius is often aided by what is called accident. A carman had gone on board, through curiosity, perhaps, and was taken along on the trip.

After the boat had proceeded some distance, the steam began to fall, and the engineer was about concluding that the experiment was a provoking failure, when he was startled by a sudden rise of the steam in the guage. In a few moments, it had risen to *nine*, then *eleven* inches. Surprised, and wondering what could be the cause, he proceeded to examine, and found the carman standing beside the fan-blower, keeping the band, which worked the blower, *tight* with a cart-rung, which he had taken aboard in his hand.

The band had been put on slack, and the carman, in making his tour of observations, noticed that it did not keep the blower in a regular motion, and applied his cart-rung with signal success! Little did that carman think, when he stepped on board with his cart-rung in his hand, that he and it were to be agencies in the success of an experiment so important in its results. The *Passaic's* boiler was afterwards altered for the use of coal.

The first boilers having furnaces originally adapted to the use of coals, were those of the steamer *North America*, made three months after the experimental trip of the *Passaic*, in 1839. Wood has, since that time, been almost entirely superseded.

THE STEAMSHIP ERICSSON UPON THE ATLANTIC.

The passage of the steamer *Ericsson*, from New-York to Havre, has developed an astonishing economy of fuel, never before attained by a side-wheel steamer. The voyage occupied fourteen days and three hours, including a stoppage of eight hours. The average daily consumption of coals was 21¾ tons. Complaint is made of an improper distribution of float surface in her wheels—the paddles being too numerous, and cutting the water into foam. This was ascertained by experiment, when it was shown, that, while with an average of eleven revolutions of the engines, for one 24 hours she made 202 miles on a consumption of 18 tons of coal, on the succeeding 24 hours, with the same weather and sea, with *fourteen* revolutions of the engines, and a consumption of 26½ tons of coal, she made only 208 miles. The old steamship *Washington*, one of the first ever built in New-York, left at the same hour, and made the passage to Havre in 12 hours less running time.

The following letter from the owner of the *Ericsson*, Jno. B. Kitching, Esq., to Chas. H. Haswell, Esq., engineer, of New-York, has been placed in our hands for publication, and we gladly lay it before our readers. Its writer deserves very great credit for his perseverance and unflinching adherence to an idea, which, although impracticable, has led to the same result—ECONOMY OF FUEL—in the course of expensive experiments which he has had the courage to undertake. The *Ericsson* is still a *novelty*, and has made a successful experiment with *steam*.

PARIS, July 5th, 1855.

CHAS. H. HASWELL, Esq., New-York.

DEAR SIR:—Presuming that you would be glad to hear the particulars of our consumption of coal, on board the "Ericsson," during our voyage to Havre, it affords me great pleasure to state, that the result of the entire passage fully sustains "*your report*," for the two days trial at sea, and puts to flight altogether the doubts of those who supposed they knew more than yourself and others, who witnessed *that trial*. However, I am not surprised at the doubts expressed by many of our "steam" friends. Parties

associated with ships, consuming from 45 tons (the most economical of them) to 90, and even 100 tons per day, find it hard to believe that a novice at the business has, by throwing prejudice and old fogyism a little aside, found it practicable to propel a ship like the "Ericsson" well, upon less than 22 tons per day, across the Atlantic. The *facts* now take the place of *theory*, and admit neither of question or doubt. We had every variety of weather, 2½ days *very rough*, 9 days head wind, (light, generally,) but *no* good opportunity to make a first-rate day's work. The ship ran along from 210 @ 249 miles per day, and the engines worked beautifully under all circumstances. We lost 8 hours in consequence of *bad* India-rubber in our air-pump valves, which is now being made right; but we had far too much slip in the wheels, too many buckets, and I find many of our best ships have suffered from a like cause, and altered their wheels, as practical experience seemed to dictate. But for these two causes we should easily have made the passage in 12½ days. The wheels traveled quite sufficient to do this; with the slip our fine modelled ship is entitled to, you will see that her future performance will quite bear me out in this.

Our consumption of coal for *several days*, ranged between 17 @ 19 tons.

I am dear sir,

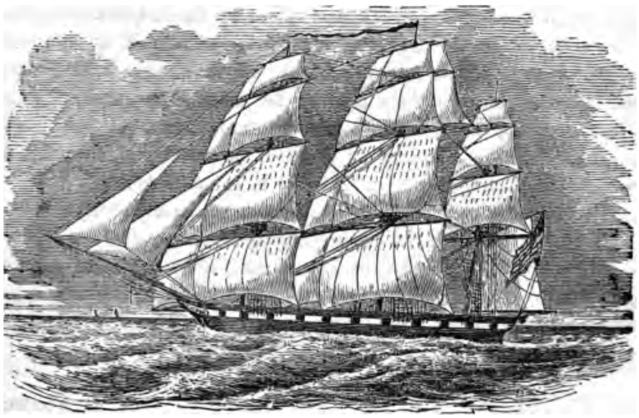
Yours truly,

JNO. B. KITCHING.

AMERICAN VESSELS IN THE PORT OF HAVANA.—The following comparative statement of the number of vessels, their tonnage, and the nations to which they belong, which entered the port of Havana during the first six months of the ten years last past, is from the Havana *Mercantile Report* of the 7th inst. It will be seen, that while the American tonnage has increased more than two hundred per cent., the Spanish and British is nearly stationary. The total number of vessels which entered the port during the six months ending July 1st last, was 1,080, of a tonnage of 364,933, and it will be observed that of these, 570, of a tonnage of 231,484, were American. The French tonnage, which is not included in the statement we give, has increased from 1,761 in the first six months of 1846, to 8,269 for the same period in 1854, and 23,233 (more than two-thirds of the British) in 1855. In the tonnage of other nations—Belgian, Dutch, Danish, Bremen, Hamburgh, and others—there is no marked change.

	AMERICAN.		SPANISH.		BRITISH.	
Years.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
1846	358	71,722	319	55,528	61	32,969
1847	544	96,870	269	50,442	138	43,178
1848	489	103,605	289	56,001	72	31,992
1849	526	132,621	287	54,318	104	37,895
1850	421	171,985	298	56,718	126	50,864
1851	543	203,903	301	60,302	124	38,871
1852	517	217,096	305	59,101	98	34,170
1853	505	181,656	270	54,549	81	31,924
1854	557	188,055	324	62,933	80	37,839
1855	570	231,404	280	58,338	72	32,105

Nautical Department.



METHOD OF RIGHTING A CAPSIZED VESSEL.

We have been favored with the following description of a practicable method of righting a capsized vessel at sea by another vessel, which was originally communicated to a Boston paper, in 1849, and is now republished for the first time through a medium better calculated to reach the eye of the *nautical* community. It may not be amiss to add, that in all matters relating to improved devices in navigation, no man in America has devoted more thought than Mr. Forbes, and we therefore recommend his suggestions to ship-masters:—

Boston, *April* 30, 1849.

Dear Mr. Editor,—Herewith you have a letter from William Ropes, Esq., referring to verbal suggestions made to me, and giving an account of the origin of those suggestions—I think the subject of too much importance to permit it to sleep, I therefore give you as briefly as possible directions for righting a vessel found bottom up.

Bore two holes through the keel, say from thirty to fifty feet asunder, according to the length of the vessel, insert from the opposite side to that where the weight is to be applied, stout bolts, fitting loosely—attach to each a hawser or stream chain leading to the anchors on the bows of a ship, and to them bend the bight or end, as the case may require, at any convenient

distance, depending on the state of the weather, say twenty fathoms from the keel; if the wreck is large in proportion to the ship, attach more weight to the anchors; make another hawser or stream chain fast to the bilge of the wreck as far down from the keel as possible, and on the side opposite to the ship, and carry this to the windlass, or to the bitts—the ship is supposed to be to leeward of the wreck, and riding by the last-named hawser—all being ready, let go the anchors, and heave all aback simultaneously. The weight of the anchors and the bights of the chains, which must be permitted to run out as quickly, and as far as may be prudent, and the strain on the riding hawser must right the wreck in most cases; and in doing so, the loose bolts come out of the keel, or are cut, if required, close to the wreck—the anchors remaining to be hove up as usual.

It is not expected of course that all this can be done in rough weather, or with all wrecks, but in many cases it would be successful—and in some, lives might be saved. The case of a schooner, lately fallen in with by a pilot-boat, where several persons met with a horrid death, is a case in point, where any vessel excepting a pilot-boat could have righted her, and probably rescued the sufferers.

Very truly, yours,

R. B. Forbes.

SAILING DIRECTIONS FOR THE RIVER MIN TO FUH-CHOW-FOO.

The following directions for navigating the River Min are given upon the authority of Her Britannic Majesty's Surveying officers in the China Seas, and we presume may be relied on:—

The best time for entering the River Min is half flood to half ebb.

There are 15 feet on the Outer Bar, and 13 feet on the Inner Bar, at low water spring tides; and at low water neaps, 19 feet and 17 feet respectively.

When the North Sands begin to dry, there are barely 16 feet on the Bar. At low water springs, there are about 3 feet dry; at neaps they do not show.

In fine weather, the North and South Breakers appear from half ebb to half flood, under similar circumstances, the outer knoll seldom until after the last quarter; but in bad weather, a line of breakers extends from the outer knoll, right across to the North Bank, and a continuous line from the South Breakers to Black Head.

The first of the flood tide comes in from the N. E., and setting with great velocity through numerous small channels and over the North Banks, the great body of it (from Rees Rock inside) sets across the Sharp Peak entrance of the river, straight for Round Island, gradually changing its direction for Hokeanga as the tide rises. The first of the ebb comes from the direction of Round Island, and sets across the Sharp Peak entrance over the North Banks; as the tide ebbs, the stream takes the regular channel.

On Rees Rock, the strength of the ebb runs to the Eastward until nearly low water, when it changes its direction to the S. E. The flood tide now coming in from the N. E., turns the stream off to the Southward; and near the knoll, it runs strong to the S. S. W. for 3 hours, changing its direction to the Westward as the tide rises; after half flood, the stream sets in for Round Island, and abates considerably in strength.

The Channel North of the outer knoll (from the numerous patches) is not safe, and ought not to be attempted by large vessels.

To run for the South Channel, the Southern Breakwater rock, nearly in line with the South part of the Middle Dog, is the mark generally used in cloudy weather by vessels frequenting the port. High Sharp Peak, open to the Southward of Sharp Island Peak, is a good mark to lead in between the knoll and South Bank until Triangle Head comes open off the small black rocks off Sand Peak Point, or until the North Breakers bear North; then haul up N. W. or N. N. W., (according as ebb or flood is running,) and crossing the Outer Bar, gain the deep channel to the Northward.

In passing to the north of the Nine Feet Patch, the sharp shoulder should be well open to the Northward of the Sharp Island Peak before Sand Peak comes on with the middle of the Black Rocks off the point; if passing to the Southward, the Sharp Shoulder should be kept a little open to the Southward before passing that line of bearing.

When Sand Peak appears well open to the right of the Black Rocks, Sharp Shoulder may be brought in line with Sharp Island Peak, gradually opening the Shoulder to the Southward, as Serrated Peak comes on with S. E. tangent of Woufou, which now becomes the leading mark until the middle of Brother A. comes with the right high tangent of Brother R., (Beacons are proposed to mark these spots,) with which cross the Bar, steering a mid-channel course when Round Island comes on with S. E. tangent of Woufou.

Small vessels turning in over the Inner Bar, will find the following marks useful—Stand no nearer the North Bank than Temple Point in line with Sharp Peak Point; nor nearer the S. E. side of Hokeanga Bank, than to bring the right high tangent of Brother A. in the line with the left high tangent of Brother B.

There is a good anchorge in 5½ fathoms stiff mud, outside the Inner Bar, with Brother B. in line (or a little open) off Sharp Peak Point, and Rees Rock in line with Black Head.

Sharp Peak of Island kept open off Woga Point, clears the Six Feet Rock off Temple Point; shut the Sharp Peak in behind the high land of Woga, and you can go inside the Temple Point rock.

In the N. E. monsoon, the high land of Woga in line (or a little open) with Temple Point, is a good line to anchor on; in the S. W. monsoon, Woga Creek is the best anchorage.

The Kinpai Pass is dangerous to strangers, particularly at or near the spring tides, for the current meeting the rocks with great force, cause eddies that occasionally run across the stream. With the flood a dangerous eddy extends from Kinpai Point in the direction of the Ferry; and for this reason the passage North of the Middle-ground is considered the best.

After passing White Fort, close with the Northern shore, it is very steep, and may be approached with safety. The apex of Pass Island in line with White Fort tangent, is a near clearing mark for the shoulder of the middle; it is therefore recommended to shut Pass Island in altogether until past that point, opening it again immediately afrerwards.

The danger of this passage is in passing the Shoulder, which forms a sharp angle of the bank, with only one foot at low water spring tides, and

four fathoms close to; from this point to the opposite shore, the distance is only 1¼ cables. After clearing this point, in passing either up or down, the tide tends rather to set you from the bank into the stream.

The high serrated Peak in line with Ferry-House, leads through between the Middle and Quantao Shoal, and is a good line for ships to anchor when coming down the river, and waiting for an opportunity of dropping through the Pass.

The Tongue Shoal is steep too, and has seven feet near its Northern extremity. This part is cleared by keeping the Ferry-House midway between Kinpai Bluff and the Tower, until the apex of Kowlooi Head comes on with Half Tide Rock.

Between Half Tide Rock and Tintao, the bottom is very irregular. The Scout Rock is the end of a ledge projecting 25 yards from Couding Island, with seven feet near its extremity. The Spiteful Rock shows at low water; it is a part of a rocky ledge projecting about 30 yards from the Island. To pass between the Spiteful Rock and Losing Spit, do not shut Younoi Head with Flat Island until the Black Cliff Head (marked by a white spot) comes in line with the North tangent of Twaisee Island. The Pagoda Rock is two feet dry at low water spring tides.

The best anchorage is from this rock for about a mile above it. Should this anchorage be full, I would recommend vessels to anchor pretty close to the South shoulder of Losing Island, where they will be out of the strength of the tide.

In dropping through the Mingan with the ebb tide, it is necessary to guard against a dangerous eddy, setting from the point above Conding Island on to the Scout Rock.

Although many of the above remarks will be unintelligible without reference to my late survey of the river, they are published in the hope that strangers proceeding to that place may pick out some useful information.

John Richards,
Of H. B. M. Surveying Brig Saracen.

MARINE DISASTERS ON THE PACIFIC COAST IN 1854.

We are indebted to Capt. Hoyt, the efficient Agent of the New-York Underwriters, for the following important report:

San Francisco, *Dec. 31st*, 1854.

Elwood Walter, Esq., *Secretary of Board of Underwriters, N. Y.*

Sir:—I respectfully submit to the Board of Underwriters of New-York, my Annual Report of Marine Disasters that have occurred (within my knowledge) during the past year on this Coast, and other items that may be of interest.

The number of marine disasters, as will be seen by the following list, is 36.

Estimated value of vessels, cargoes, and freight, is $2,375,000.

Estimate for repairs, salvage, and total losses, $1,315,000.

Number of certificates issued at this Agency by me for damaged goods, or two years, 1,490.

During the past year several accidents have occurred to vessels entering and leaving this port. The loss of the San Francisco and Golden Fleece, together with the narrow escape of several outward-bound ships, has induced the masters of large vessels to take steam.

There are at present two small tugs of sufficient power to tow small ships, or large ones, if they have the tide with them. Also, a large propeller, of seven hundred horse-power, fitted expressly for towing and assisting vessels in distress, night or day, having on board, cables, anchors, boats, and a first class steam pump.

I have no hesitation in saying that the navigation on this Coast is better than any other part of the world: during the past year there has been but one gale, and then it did not blow so hard but that a ship could work off shore. We are exempt from typhoons, hurricanes, pamperos and sudden squalls. There has been but one vessel struck by lightning for seven years; and I have seen but one flash during my residence here. Farther north, however, the weather is different.

During the last two years several steamships have gone ashore, by running in thick fog, and these accidents will continue to occur as long as the travelling public sanction such a course to save time, or till some fearful accident like that of the "Arctic" opens their eyes.

The subject of ships damaging cargo by sweat, has given me much annoyance, and the merchants of this city have lost large sums from this cause; as it is the custom here to pay freight before delivery of goods, they get no reclamation from the ship. It is my opinion that the ventilators leading to the lower hold, do not answer the purpose. The covering board and bit ventilators are very well to keep the ship cool in fine weather. The main trouble is, the heated air rises between decks, and when the vessel is off Cape Horn, or in cool latitudes, is condensed on the lower side of the deck and runs back on the cargo. I have seldom found "sweat" at the extreme ends of the ship, or under the deck-houses or poop. The remedy, in my opinion, is this:—To have their large ventilators between the fore and mizzen-masts, leading only to the between decks, and one forward and aft to the lower hold. These would keep the ship cool at all times. I have my doubts if "sweat" can be prevented altogether; but if this was done, it would satisfy the merchants that the owners had done all in their power to protect the cargo. That it is possible for a ship to bring her cargo in good order, is illustrated by the ship Thomas Watson, now discharging. She has brought five cargoes to this port from Philadelphia, and not a package has been damaged by "sweat," bad stowage, or salt water.

The amount of Treasure shipped to New-York and New-Orleans, in 1853, was.................................... $48,305,228 00

The amount of Treasure shipped to New-York and New-Orleans, in 1854, was.................... 45,476,612 00

The arrivals from New-York in 1853.......189—in 1854......81
The arrivals from Boston in 1853..........104—in 1854......54
Total number of arrivals in 1853. ....862—in 1854......617
Showing a falling off from New-York of.....................108
Showing a falling off altogether of..........................245

I account for this decrease of arrivals by business generally being entirely overdone in the year 1853.

I am indebted to Major Graham, Superintendent of Lighthouses on this coast, for the following valuable information relative to the completion of certain lights and their locality, and of appropriations already made by Congress for others:

San Diego Lighthouse—Completed. Illuminating apparatus shipped.
Santa Cruz Island—Appropriation made.
Point Conception Lighthouse—Completed. Illuminating apparatus shipped.
Point Pinos Lighthouse—Completed. Lights being put up, will be open in a few weeks.
Faralones Lighthouse—Completed. Illuminating apparatus arrived at San Francisco; will be put up in a few weeks.
Point Lobos Lighthouse—Appropriation made.
Point Bonita Lighthouse—In course of construction; will be lighted by May 1st, 1855.
Puntá de los Reyes—Appropriation made by Congress.
Fort Point Lighthouse—Nearly finished; lighting apparatus arrived; will be in operation in a few weeks.
Alcatraz Light—Completed, and light in operation.
Humboldt Lighthouse—Completed; apparatus shipped from New-York.
Umpqua—Appropriation made by Congress.
Cape Hancock Lighthouse—Completed; lighting apparatus arrived at San Francisco; will be in operation in a few months.
Cape Flattery—Appropriation made by Congress.
Santa Cruz Harbor—Appropriation made by Congress.
San Pedro Harbor—Appropriation made by Congress.

The buoys required for this harbor are nearly ready, and will be placed on the dangerous places soon.

I learn from Lieut. Alden, commanding the U. S. Coast Survey on the Pacific, that he is giving his attention to a survey of the bar and entrance to this port. A correct chart of this entrance and set of the tides will be of great importance to navigators.

Very respectfully, your ob't serv't,
JOHN C. HOYT,
Agent N. Y. Underwriters.

LIST OF MARINE DISASTERS.

January.—Ship Arab, in entering the habor, was in a dangerous position near Mile Rock—was relieved by the steam-tug Resolute.

Steamship Golden Gate, Isham, from Panama to this port, broke a shaft at sea, put into San Diego with one wheel; in coming out of that place, run aground; was got off and towed to this port.

Schooner San Diego, dismasted, bound to Oregon.

Brig Walcott, lost two anchors in Trinidad Bay.

Barque Messenger and brig Vesta came in collision off the Heads.

Brig J. B. Brown, struck by lightning, carrying away spars and rigging.

Barque Walter Claxton, ashore at Mendocino, got off again.

Schooner Anson, total loss in Bellingham Bay, Oregon.

February.—Ship San Francisco, Stetzer, of and from New-York, in entering the harbor, was totally lost by the carelessness of the pilot. Value of ship, freight, and cargo, $500,000.

Schooner Tennessee, from Richmond, Va., lost spars, sails, &c.

Schooner Invincible was totally lost in Noyou River.

Schooner Excel, total loss near Point Reyes.

Brig William was lost on the passage to Puget Sound.

Schooner Sacramento, totally lost on Fort Point in leaving port.

Schooner Sarah Lavinia, never been heard from, supposed lost.

Schooner L. P. Foster, dismasted near Puget Sound.

Brig Wellesley, from Puget Sound, lost her spars, sails, &c.

April.—Ship Golden Fleece, of Boston, in leaving port in charge of a pilot, was totally lost on Fort Point.

Ship Bald Eagle, was obliged to anchor near North Head; lost anchor and 45 fathoms chain.

Steamer Sea Bird, from San Diego, broke machinery, came to anchor near Point Conception, and was towed to this port by U. S. steamer Active, Capt. Alden.

Brig Eliza Taylor, total loss on Point Pinos.

Barque Walter Claxton, lost near Mendocino.

Schooner Bay State, lost on the coast.

May.—Steamer Arispe, struck near Fort Ross—total loss.

June.—Schooner S. D. Bailey, carried away spars, sails, and rigging.

Schooner Gazelle, lost sails, bulwarks, &c.

August.—Brig Tarquinia, ashore at Puget Sound.

September.—Brig Oriental, ashore near Port Orford, lost anchors and chains.

British barque Amelia Thompson, was lost near St. Simeon's Bay, and nearly all the cargo.

Schooner Iowa, lost anchors and chains at Pajaro Bay.

Steamship Yankee Blade, lost by running on a rock in a thick fog near Point Conception. She soon broke up, and a number of passengers were drowned. There was $153,000 in specie on board, of which $70,000 has been recovered from 70 feet water. Salvage awarded, 60 per cent.

December.—Ship Contest shipped a sea, which stove bulwarks, broke stanchions, &c., and swept away house and contents.

French ship Paragon, from Bordeaux; barque Frances Palmer, and barque Equator, from Manilla; all have experienced very heavy weather, and were obliged to jettison cargo.

There has been several disasters to steamers on the river, but the value of property was not large.

Considering the very large number of vessels navigating this coast, the above exhibit shows but a small loss. It is altogether insignificant compared with the marine losses on the Atlantic Ocean, which have swelled this year to an amount enormous beyond all precedent. It may, we think, be safely asserted, that more vessels have been wrecked, and more lives lost on the sea this year than during any two years within the memory of the present generation. In Torres Straits alone, upwards of seventy vessels had been wrecked during the first seven months of the present year. The number wrecked or damaged on the Atlantic we have no means of determining exactly, but some idea may be formed from the list of wrecks and casualties at sea, registered at Lloyd's, from 1st January up to the 1st October last. It discloses a frightful catalogue of ships missing, and which are now given up as lost, having, it is supposed, foundered with all hands on board. In all, there appear to have been no fewer than forty-eight, which do not include the losses of the "Madagascar" and the ill-fated "City of Glasgow" screw-steamer, with which upwards of 580 unhappy creatures were lost, nor the "San Francisco," nor the "Franklin," nor the "Philadelphia," nor the "Arctic," all first-class steamers. Of the forty-eight enumerated in Lloyd's list, a large number were vessels bound across the Atlantic, carrying many passengers. Among them were the following:

The Waterloo, from Liverpool to New-York; the Ann, Capt. Atkinson, from Quebec, for Bristol; the Leviathan, of and from New-York, for Dunkirk; the American Lass, Capt. Cousins, from St. John's, N. F., for Oporto; the Emma Field, from Bath, U. S., for Liverpool; the Gipsey, Capt. Stevenson, from St. Johns, for Greenock. Also the ships Arco, of New-York; the Agnes Hall, from Montevideo; the Wilberforce, Syria, Urgent, Antilles, John Wickliffe, Gov. Briggs, Wm. Thompson, Sarah, (Peterson,) Ann Tift, Spectator, Red Rover, Richard Watson, and the Abbe, of Bridgeport.

The remaining vessels were schooners and brigantines. Strange to say, not a vestige of any of the unfortunate vessels has turned up—not a fragment has been discovered.

LIEUT. MAURY'S NOTICE TO NAVIGATORS—A LETTER FROM ON BOARD THE MAIL STEAMER ILLINOIS.

The following letter has been sent us for publication by Lieut. Maury, to which we invite the attention of ship-masters:

MAIL STEAMER ILLINOIS, JUNE 23, 1855,
Lat. 30° N., Long. 73° 43′ W.

LIEUT. MAURY:

DEAR SIR,—About an hour ago we passed close to the wreck of brig Westport, of Boothbay; both masts gone near the deck, and stripped of everything moveable. She had the appearance of having been in collision with another vessel, her bow being badly stove, and forward bulwarks car-

ried away. She was a low-decked craft, and her main deck was awash, not more so, however, than I have often seen in that class of vessels when deeply laden. Her high quarter-deck was dry, although there was quite a fresh south wind and something of a sea on, and its bulwarks in good order. I have known vessels looking in worse trim, worked into port, even during the winter months. Looking over the list of disasters in Griffiths and Bates' *Nautical Magazine* for June, I find this entry: "Brig Westport, from Georgetown, S. C., for Damariscotta, abandoned April 21, in lat. 34° 24′ N., long. 75° W." Our lat. at the hour of passing her was 30° 05′ N., and long. 73° 40′, corrected from observation at noon, and altitudes at 4 P. M. This shows her to have drifted in a S. by E.½E. direction, (nearly) about 260 miles in the 63 days since her abandonment, averaging not less than 4′ per diem. She is an ugly thing, lying thus in the track of the Aspinwall Steamers and sailing vessels running down for crooked S. passage. She ought if possible to have been set fire to or blown up on leaving her, and not left as a floating trap for other craft.

If this mite should prove of any service in your arduous researches in oceanic currents, I shall be very glad,

And am, with the highest respect,

Your obedient servant,

JAS. P COUTHNEY, *Passenger.*

I have kept the following rough abstract of the trip, the best I could under the circumstances, and I shall be glad if it be of the least service. Not one trial of current or temperature made in the passage, so far as I can learn.

Steamship Illinois, from New-York for Aspinwall, passed Sandy Hook on 20th June, 1855, at 4.40 P. M.

DATE.	WINDS.	LAT. NOON.	LONG.
June 21,	South light	37° 36′	73° 58′
22,	S. by E. mod	34 22	73 20
23,	S. by E. to S.S.W. mod	30 56	73 45
24,	S.S.W. to S.E. mod	27 29	74 00
25,	S.E. to E. mod	23 54	74 22
26,	E. brisk Trade	20 24	74 12
27,	E. to E.N.E.	17 00	75 53
28,	E.N.E. to S.E.	13 39	78 00
29,	E.S.E.	10 30	79 35

Anchored in Aspinwall at 5 P. M. 29th. Log 21st, 202′; 22d, 184′; 23d, 208′; 24th, 208′; 25th, 215′; 26th, 207′; 27th, 230′; 28th, 237′; 29th to noon, (could not get it.)

Should any other navigators fall in with this wreck, they will confer a favor by reporting to Lieut. Maury, National Observatory, Washington.

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Lat. 30°

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26,	[illegible]	20 24	74 12
[illegible]	[illegible]	17 00	75 53
[illegible]	[illegible]	13 39	78 00
[illegible]	[illegible]	10 30	79 35

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[illegible] in with this wreck, they will confer a [illegible], National Observatory, Washington.

LOSS OF SHIP GEORGE L. SAMPSON BY FIRE AT SEA.

The ship first loaded at New-York for San Francisco in December last, and started in January, when she struck on the bar. She then returned and discharged her cargo, which has been estimated at $300,000, among which was a quantity of oil-cloths. Had she gone on without striking, in January, she would, in all probability, have reached her destination in safety, but as her cargo lay some time in store, and was then re-shipped, and of course re-stowed, it is conjectured that the frequent removals may have tended to spontaneous combustion, especially with such goods as oil-cloths.

CAPTAIN COBB'S STATEMENT.

Ship George L. Sampson, J. Adams Cobb, master, left New-York, April 1, for San Francisco. Everything went on as usual, until 1.45 on the morning of the 3d of May, we were aroused by the cry of "fire." On reaching the deck, found smoke issuing from the main hatch. Immediately ordered the hose stretched along, and got the engine at work; at the same time hauled up the canvas. and put the ship before the wind to stop the draft. Took off fore and after hatches to find in what part of the ship the fire was. Found no smoke come from them, and replaced the hatches at once. Set the carpenter to work stopping all the ventilators. Took off the main hatches, and played the hose down. Notwithstanding all our exertions, found the fire gaining. Put on the main hatches and secured them, and cut holes in the deck to flood the lower deck if possible, but on screwing the ventilators aft, found plenty of smoke, and as there was no smoke from the after hatch, was forced to the conclusion that fire had originated in the lower hold, and that there was no chance of saving the ship, and therefore took instant measures for leaving. However, so fast did the fire gain, that in one hour from the first alarm the fire was bursting through the deck fore and aft. When in the act of hoisting out the long boat, she took fire, and we were driven out on the jib-boom. In one hour and ten minutes we found ourselves (twenty-eight in number) in two small boats, without a drop of water, and only provisions enough for one day. Providentially, at day-light, we saw a ship running for us, and soon found ourselves on board the ship Northern Eagle, of Boston.

The same day, fell in with the bark Oostergoo, of Amsterdam, Captain Hagelhoff, who received eighteen on board. On the 7th, fell in with the ship Revere, of Boston, who took six men on board. On the 18th, fell in with the ship Prince Regent, of and from Hull for Quebec, who, after

being informed of the case, and that the Oostergoo (out now 100 days) was short of water, *positively refused to receive any one on board except as passengers.* While feeling the deep obligations we all were under to Capt. Hagelhoff and his officers, for the undeviating kindness we received while on board the Oostergoo, I cannot refrain from expressing the deep loathing and contempt I feel for a man so devoid of all feeling of humanity as the captain of the Prince Regent.

J. ADAMS COBB.

STORM-TIDES ON THE LAKES.

THE tidal phenomena on the Lakes have attracted considerable attention during the present season. It is well known that there are no regular tides in our great Lakes; but it is equally true that storm-tides, such as mentioned below, do frequently occur. One of the most singular instances of this kind was witnessed on the 18th day of May, 1855, on both sides of Lake Ontario, and was described as occurring in the following manner on the same day on Lake Huron :—

The Owen Sound *Comet* says: "In this bay, the water rose about nine feet, and immediately fell ten feet below its usual level, so much so that the bottom of the bay was dry enough to allow a man to cross to the Indian village."

The storm at Owen Sound on the day of this phenomenon was very severe. Vessels were broken from their moorings, piers were displaced, and twenty-five houses and barns were unroofed or blown down. Hail stones were picked up measuring from four to five inches in circumference.

A writer in the Chicago *Tribune* thus explains his theory of *Storm-Tides :—*

"Having noticed in the *Tribune* of yesterday an article on the phenomena of the rise and fall of water in the Chicago River, and asking explanations, I would beg to contribute what might be considered a rational view of the phenomena, and also such facts as I possess.

"I attribute the sudden fall and rise of water at this port, and also at other places on the deep lakes, entirely to barometric changes in the atmosphere immediately over the lakes, and at or near the places where the phenomena are observed. It is well known that the barometer is very feebly affected by the passage of the tide waves of the atmosphere due to the attraction of the moon, in comparison to the effect produced by the passage of a great storm. The atmospheric effect of lunar attraction being general, and acting upon the surface of the whole globe, is producing corresponding changes

over its whole surface at the same time; while the effect of the passage of a severe thunder storm, across any portion of our lake—affecting the barometer from ten to fifteen times more intensely than the Oceanic Tide Cause—would tend to produce a sudden and local tide, corresponding to the intensity of the barometric change in the central track of the storm. The first wave would culminate under the centre of the storm, and travel with it until it struck the shore, or if north or south on Lake Michigan, until its sustaining cause ceased. The fall and rise of water along the shore would be regulated, as in lunar tides, much by the configuration of the shore, and the direction in which the tide waves strike it. At the point where the centre of the storm passed on or off the lake, the change of level would be greatest.

"The small tide waves mentioned yesterday were no doubt caused by the re-action of the great wave along the Chicago River. Such phenomena have been observed on Lake Ontario, only in a much smaller degree than on Lake Michigan, due most probably to the difference in their size and depth.

"I think that no such phenomena have ever been observed in Lake Erie; it is too shallow to admit a great tide-wave to generate, although its height at either end is more affected by strong winds from the same cause than the deep lakes.

"Lake Superior, from its vast size and depth, I think would be found to possess this phenomena in a still more remarkable degree than Lake Michigan, if it were more known.

"A few tidal and barometric observations at Calumet, Michigan City, St. Joseph, Kenosha, Milwaukie, Two Rivers, and this place, during thunder storms, would soon lead to the discovery of the true cause of this anomaly. Who will observe in those places?"

"G. D. Hiscox."

If Mr. Hiscox's observations be correct, there is a plain distinction to be made between *Barometric* and *Wind* tides. For instance, Lake Erie is said to be too shallow to permit the generation of the barometric tide, whilst it is notorious that for this very cause wind-tides reach a greater altitude on it than is known upon the deeper lakes. We think it will be found that the highest tides have occurred over shoal beaches, and up bays and sounds, and if so, far less influence should be attributed to barometric causes in the production of *storm*-tides than the above writer feels disposed to allow.

SEIZURE OF A VESSEL BY PIRATES.

In our impression of Thursday last we briefly reported the loss of the "Conference," Peters, of and from North-Shields, to Carthagena. The following particulars are furnished by Capt. Peters, in a letter dated Gibraltar, May 18:

The "Conference" was taken by pirates on the 2d May, off the coast of Barbary. We left the Downs on the 17th April; after a fine run down the Channel we took our departure from the Lizard Light on the 20th, rounded Cape St. Vincent on the 28th, and on the 30th April we passed Europa Light with a strong westerly breeze, and every appearance of a prosperous voyage.

At 6 P.M. the same day it became calm and continued all night, and at daylight on the 2d May we were between 20 and 30 miles to the westward of Cape Tres Forcas, and about 15 miles off the land. I observed two boats, which I supposed might be fishermen. Shortly after I observed three more boats put out from a creek or river; the two first lay to on their oars until the others joined company; then they came in the direction of our ship, which was still lying nearly becalmed. It never crossed me that they were armed pirates, until they continued so long rowing in the same direction. On their coming near to us I observed the boats to be very large and crowded with men. I then heartily wished for a breeze. When at about a quarter of a mile distance they opened a tremendous fire upon us, apparently with very large swivel-guns. It was then thought high time to save our lives if possible; accordingly the boat was in a few minutes launched over the side.

The crew being all fresh and young men, with the exception of the cook, who fell in the hurry and broke one of his ribs, soon gained the boat, which I steered to the north-east, keeping the ship between us and the guns. The pirates kept pulling hard toward the ship, and continued a constant fire on our boat. The headmost boat kept the chase, and when about five or six hundred yards near us he gave up pursuit, after giving us a shot which was not an arm's length from the boat. The shouts of the ruffians when they thought they were gaining upon us were most hideous. After getting clear of them we hove to on our oars, in order that I might observe their movements with the glass. As soon as they got on board of the "Conference" the helm was put up, with the ship's head for the land. We watched our vessel as long as it was prudent to do so. There could not be less than two hundred men in the pirate's boats.

We then remained exposed on the open sea, without any kind of food or water, and a hot sun beating upon us. We saved nothing but a wooden steering-compass and a spy-glass. The pirates would probably take everything out of our ship that was useful to them, and then scuttle her, because it being only about 90 miles from Gibraltar, they would expect a man-of-war to be dispatched in pursuit; but unfortunately our long passage to that place gave them plenty of time to carry their views into effect. After we had rowed about another hour to the N.E., we got sight of a vessel bearing about north of us; the oars were immediately double-manned, and all our strength put on.

At 4 P.M., we got up with the vessel, and glad we were as we neared her, in the hopes of our being taken on board, and receiving at least a small supply of bread and water, as we had made up our minds to steer for Gibraltar. When we got alongside, we found no one to make their appear-

ance, and we went on board and found the ship abandoned by her crew. I observed a boat rowing to the north of us, and it struck me that it might be the crew of the ship we had boarded. I then got the burgee and hoisted it at the peak end, in order that it might be seen, and if they were the crew they might return to their ship. I lost sight of the boat shortly after; there was at the time a light air from the westward and the ship's head going to the land. We therefore sounded the pumps and found only 19 inches water in the well. I then took command of her, trimmed the yards, and put the vessel's head to the northward.

There were at the time a bark and a schooner on our lee-bow, distant about 8 miles. It struck me the crew might have seen our boat and mistaken us for pirates, and that they might have got on board the bark. What could be the cause of them leaving their vessel we could not imagine, but perhaps they had seen the smoke from the pirates' craft when they were firing at us—it being then calm the smoke from the fire-arms would ascend to a great height. From the papers on board we found the vessel to be the "Lively," of Stockton, James Napier, master. We arrived at Gibraltar on the 18th, with the loss of foretopmast. Immediately on arrival, I applied to the captain of the port to induce him to send a man-of-war to recover, if possible, the "Conference," but he informed me he could not do so for two reasons—first, he had only one war steamer, and it was impossible to spare her; and in the second place, if he had been able to comply with my request, it would be of no use, as such a length of time had elapsed since our ship fell into the hands of the pirates. I therefore may, I suppose, conclude that our ship is totally lost.—*Liv. Ship. Gaz., June 5.*

NATIONAL SHIPS LOST.

Our navy, as at present organized, dates from the year 1794, and it is perhaps not a little curious that one of its first prizes should have been the first vessel lost without any one being able to say how she was lost. In 1799 the frigate Constellation, then under command of Captain Truxton, captured the French frigate l'Insurgente, after a very gallant action. This was during what was called the quasi war with France, caused by the depredations that were made upon our commerce by the cruisers of that country, which we very properly resented. The prize was taken into the navy, and was first commanded by Capt. Murray, who was succeeded by Capt. Fletcher. The latter officer sailed on a cruise in July, 1800, with a sort of roving commission. Some letters were received from persons on board of her, sent in by vessels that she spoke; but, though she was to have been absent only eight weeks, nothing has ever been seen of her for almost four-and-fifty years. The Pickering, Capt. Hillar, a 14 gun vessel, which sailed a month later than the l'Insurgente for the West Indies, was never heard from again. The Saratoga, of 16 guns, was lost in the same way, in 1807.

One of the finest vessels that ever sailed from this country was the sloop-of-war Wasp, which left Portsmouth, N. H., in 1814, under the command of Capt. Blakeley. On the 24th of June she captured and destroyed the British sloop-of-war Reindeer, and on the 1st of September, the Avon, a vessel of the same class. One of her prizes was taken on the 21st September and sent to America under command of Mr. Geisinger, and no direct intelligence was ever after received from her. She was spoken by a Swedish brig on the 9th of October, out of which she took two American officers who had belonged to the frigate Essex, and were passengers in the Swede from Rio

de Janeiro. This was the last time that she was seen and known. Various stories as to her fate were current for years. Mr. Cooper says :—

"There is only one rumor in reference to this ship that has any appearance of probability. It is said that two English frigates chased an American sloop-of-war off the southern coast about the time the Wasp ought to have arrived, and that the three ships were struck with a heavy squall, in which the sloop-of-war suddenly disappeared."

The Wasp was uncommonly well manned and officered, and her loss was a severe one to the navy. Capt. Blakeley was an admirable commander, and the gentlemen under him were of high merit. Two of the lieutenants, Mr. Reilly and Mr. Baury, had taken part in the capture of the Guerriere and the Java, and another, Mr. Tillinghast, was an officer on board the Enterprise when she took the Boxer.

The Epervier brig, 18 guns, sailed from the Mediterranean for the United States in 1815, and was never heard from after she passed the Straits of Gibraltar. She had been taken from the English, in 1814, by the Peacock, Capt. Warrington. We believe that at the time of her loss she was commanded by one of the Shubricks—a historical name in our navy.

The most remarkable instance of the loss of a national ship, since the close of the last war with England, was that of the Hornet, which is supposed to have foundered in a "norther" in the Gulf of Mexico, about a quarter of a century ago. Nothing was heard of her, if we remember, after she left Tampico, some time in the year 1830. The Hornet was one of the "lucky ships" of the navy, and a great favorite, both with the service and with the country, and was distinguished for the part which she took in the war of 1812, capturing everything with which she fought, and escaping from superior vessels. In 1813, when commanded by Capt. Lawrence, she took the British brig Peacock, after a short but very warm action of fifteen minutes, the Peacock being sunk. Attached to Commodore Decatur's squadron, a few months later, she was compelled to take refuge in New-London, when that squadron fell in with a greatly superior British force, where she was blockaded for a long time. Escaping from New-London, she went to sea in January, 1815, under command of Capt. Biddle. On the 23d of March she engaged and captured the Penguin, a British vessel of about her own size, and with a picked crew. Subsequently she was chased for two or three days by a British seventy-four, and narrowly escaped being captured.

The recent losses of the Albany and the Porpoise have revived the interest that used to be felt in the losses that we have mentioned above. It will be seen that it is no new thing in our navy for vessels to disappear, leaving no trace of their fate, and the same remark applies to all navies.

This list embraces only those which have never been heard of after leaving port. There have been numerous other losses of national ships, among which were the capsizing of the Somers in a squall, the burning of the steamer Mississippi, the destruction of the Fulton by explosion, &c.

Bost. Chron.

A Canadian Line of Ocean Mail Steamers.—The Government of Lower Canada has decided to accept the terms proposed by Mr. Hugh Allan, of Montreal, viz.:—"Vessels of 1,750 tons and 350 horse-power to make fourteen fortnightly trips from Liverpool to Canada, and five monthly trips to Portland in each year, at an annual bonus of £24,000."

LAUNCHES.

At Baltimore, May 17, brig Wm. Wilson, 250 tons, for the Brazilian trade.

At Thomaston, (Me.,) May 15, brig Austin, 290 tons.

At Holmes' Hole, May 17th, schooner Thomas Bradley, 192 tons, for the general freighting business.

At East Boston, May 22d, propeller Antelope, 412 tons.

At Essex, May 21st, schooner Northern Belle, 200 tons.

At Westport, bark Mermaid, for the Pacific trade.

At Rockport, schooner U. D. Witherspoon, 110 tons.

At Wilmington, N. C., recently, schooner Martha Moore, 200 tons, for the West India trade.

At Matapoiset, June 3d, ship Ocean Rover, 400 tons, to carry 2,200 bbls. oil.

At Baltimore, June 6, schooner Ross Winans, for the Rappahannock lumber trade.

At Augusta, (Me.,) June 2d, schooner George Darby, 240 tons, 104 ft. on deck, 100 feet keel, 27 feet breadth, 9½ feet hold.

At Newburg, June 10th, schooner Snow Flake, 237 tons, for the general freighting business.

At Menaha, Wis., steamboat Independent Republic.

At Bath, May 10th, ship Wm. Penn, 1,060 tons.

At Philadelphia, schooner Edward W. Gardiner, 233 tons.

At Bath, (Me.,) schooner Dimodeous.

At Kennebunk, June 8th, a ship of 900 tons, named the Crimea.

At Richmond, (Me.,) June 16th, ship Washington Libby, 1,000 tons.

At Saco, June 1st, schooner Niagara, 200 tons.

At New-Bedford, June 15th, a ship of 400 tons, not named.

At New-Bedford, June 16th, bark Henry Tabor, 350 tons, whaler.

At Cherryfield, (Me.,) brig Moonlight, 275 tons.

At South Prospect, June 5, bark Serra Crocker, 350 tons.

At Castine, June 7th, brig Anna Prentiss, 280 tons.

At Damariscotta, June 30, a new brig called the Lydia Thompson, of 262 tons.

At Bath, 4th July, a ship of 1,200 tons, to be called the Independence.

At Warren, (Me.,) 30th June, a bark called the Monasco.

At Bangor, 3d July, a brig of about 200 tons, called the Sea Foam.

At East Boston, by Messrs. Boole, a ship of 1,200 tons, called the Emerald, owned by Messrs. Howland & Ridgway, New-York, for the Dramatic Line of Liverpool packets.

At Portsmouth. by George Raynes & Son, a ship 199 feet on deck, 24 feet 4 inches deep, and 38 feet wide.

At East Boston, 10th July, a bark of 350 tons, called the Gen. Warren.

At Newburyport, by Messrs. Currier & Townsend, a bark of about 300 tons, called the Arrow.

At Bath, by Mr. Dinsmore, a fine ship of 1,200 tons, owned by Messrs. J. H. Allen & Co. and others.

At Mattapoisett, 12th July, a ship of 320 tons, to be employed in the whaling business.

At Hallowell, a ship of 800 tons, called the Scotland.

At Millbridge, a schooner of 174 tons, name not mentioned.

At East Machias, by P. S. J. Talbot & Co., a schooner of 150 tons, called the Siak.

At Bath, by Mr. Timothy Crosby, a brig of 200 tons, called the Sea Foam.

At Baltimore, June 26, by Messrs. Cooper & Butler, brig Laura, of 164 tons. She is owned by Messrs. Friend & Price, and will be employed in the San Blas cocoa-nut trade.

At Fairfield, Ct., by Mr. G. W. Baldwin, a schooner of 260 tons, called the Frank Herbert.

At East Boston, by Messrs. Robinson & Burk, a bark of 350 tons, called the George Warren.

At Baltimore, from the yard of Messrs. Abrams & Ashcroft, a splendid clipper ship, of about 1,800 tons, called the Whistling Wind.

At Brewer, by Messrs. Saunders, Blake & Co., a bark of about 400 tons, called the Fidelia H. Fanning.

At Rockport, by Messrs. V. C. Hawes & Co., a brig of 250 tons, called the V. C. Hawes, owned by Messrs. Hawes, Berry & Co.

At Elizabethport, N. J., from the yard of Messrs. Crowell & Colon, a three-masted schooner of 450 tons, owned by Capt. Wm. Cathcart.

At Bath, 10th July, by Messrs. William Rogers & Son, a ship of about 900 tons.

At Cooper's Point, N. J., from the yard of Mr. David Corson, the clipper bark Charles M. Neal, 400 tons.

At Port Jefferson, a schooner of 200 tons, called the Reindeer. Also one on the 7th July, of 250 tons, from the yard of Messrs. John E. Darling & Co., called the Transit.

At Newburyport, by Messrs. Currier & Townsend, a fine freighting ship of about 1,000 tons, called the Old Colony, owned by Messrs. Nickerson & Co., Boston. Her model is the same as that of the Brewster, which recently made a passage from New-Orleans to Havre in 31 days.

At Brewer, Me., by Mr. Wilson, a schooner of upwards of 200 tons, called the D. B. Doane.

At Augusta, 18th July, a brig of about 260 tons, called the Lottie.

At Kennebunk, 20th July, a ship of about 850 tons, called the Sea Belle.

At Greenpoint, L. I., June 30, by Edward Lupton, Esq., ship Black Sea.

At Greenpoint, L. I, July 2, by Messrs. Sneden & Whitlock, steamboat Island Home. Length, 180 feet; breadth, 29 feet 10 inches; depth, 10 feet 2 inches.

SALE OF VESSELS.

Half of ship Gray Feather, 587 tons, four years old, at auction, for $7,059 cash.

Steamer Ospray, built in 1849, 608 tons, at auction, in Philadelphia, for $12,000.

Quarter of ship James Allen, of New-Bedford, 355 tons, for $3,000.

Clipper ship Sierra Nevada, of Boston, injured while docking at Liverpool, has been sold as she laid, by consent of parties, for $9,000. $7,500 of her freight will be collected at Liverpool, and the balance, $6,000 or $7,000, will be paid by underwriters.

Brig P. Soule, 179 tons register, built at Baltimore in 1845, coppered and copper-fastened, was sold at aution by L. M. Hoffman & Co., for $3,200, cash—purchased by Capt. Hilton.

Ship M. Howes, 420 tons, 8 years old, built at Hoboken, has changed owners for about $18,000, cash.

Brig Ocean Bird, 190 tons, 7 years old, built in Maine, has been sold at $6,000.

Bark Byron, 179 tons, has been purchased, by Messrs. Russell, Hafford & Co., of New-Bedford. She will be fitted for sperm whaling.

Whale-ship Mechanic was sold at auction, at Newport, 23d June, for $4,150, cash. She will be continued in the whaling business.

Ship Niagara, of Fairhaven, 538 tons, at auction, at New-Bedford, for $24,975.

Schooner Arcade, 95 tons, built in 1848, at auction, in New-York, for $1,055, cash.

Ship Decatur, A. 1., 1,293 tons register, at Boston, at auction, for $50,720, one-third cash, one-third 60 days, one-third 4 months.

Bark Warwick, 11 years old, 337 tons, at auction, in New-York, for $5,650.

Ship Alexander, 421 tons, at auction, for $9,275.

One-sixteenth of ship John Coggeshall, of Fairhaven, at auction, at New-Bed ford, 7th July, at the rate of $6,300.

NOTICES TO MARINERS.

COAST OF SPAIN ON THE ATLANTIC—ALTERATION OF LIGHT AT CADIZ.—Official information has been received at this office, through the Department of State, that the Spanish government have given notice that on the 1st June next (1855), the present revolving light on the castle of San Sebastian, at Cadiz, will be changed to a *fixed bright* light, with *red* flashes at intervals of two minutes.

The new illuminating apparatus is catadioptric, of the second order of Fresnel. The light will be elevated 143 feet above the level of the sea, and be visible 18 miles, in clear weather from the deck of a ship.

There has been no change in the position of the light.

Office Lighthouse Board,
MAY 22, 1855.

SUCCONNESSETT SHOAL LIGHT VESSEL—VINEYARD SOUND, MASS.—The Succonnessett Shoal Light Vessel will be placed at her station on or about the 17th inst., (June, 1855). She will be moored in 6 fathoms water, and nearly midway between Succonnesett shoal and Eldridge's shoal.

Cape Poge lighthouse bears from this station,	S. by W.
West Chop " " " "	W. by S.
Nobsque Point " " " "	W. ½ N.
Buoy on N. W end of Horse Shoe shoal,	E. ¾ S.

This light vessel is schooner-rigged, and has one lantern with eight lamps and reflectors. She has also two hoop iron day marks (one at each mast-head), painted red.

Her hull above plank-sheer is painted cream color, with the word "Succonnessett" painted in large red letters on each side; and below, alternate squares of red and cream color.

SAILING DIRECTIONS TO CLEAR SHOALS, ETC.

Vessels coming from the westward, and bound through the north channel o Vineyard Sound, should get Nobsque Point light to bear west, and steer east until the lightship bears E. by S.; then steer for that vessel; after passing her, the course is E. N. E. to Point Gammon lighthouse. Care must be taken to make these courses good.

All bearings are magnetic.

By order of the Lighthouse Board, June 16, 1855.

Extract of a letter addressed to Ellwood Walter, Esq., Secretary of the Board of Underwriters, dated—

MATHEWTOWN, Inagua, July 3d, 1855.

"I find this a growing place of a good deal of importance. More shipping is stopping and passing here in one day, than we often see at Nassau for months. My short cruise to this place, touching at some of the islands, has convinced me more than ever of the imperative necessity of building lighthouses. But I have so often written to the Underwriters on this subject, that I suppose I can add nothing from personal observation that will avail. But it is a disgrace to the British Government that through this entire passage, with an average of fifteen to twenty vessels passing daily, and the navigation as dangerous as any in the world, that there is not a single lighthouse. The Lloyds have paid for copper-ore ships lost in this passage, enough to build all the lighthouses needed in the Bahamas, and support them when built. By the Hole-in-the-Wall passage, we have ten vessels passing to one of all other nations, and it would seem but just that our government should pay a fair portion of the expenses. It does appear that something might be done, at least two or three lighthouses erected on the most dangerous points, if the American Underwriters, in connection with the English, should take pains to represent the matter properly to their respective governments. The best representation that could be made, would be an accurate statement of the average yearly losses, one-half, at least, of which would be prevented by the erection of four or five lighthouses.

BUOYS—NEWBURYPORT, MASS.—A nun buoy, of the third class, painted black and white perpendicular stripes, has been placed in five fathoms water at low tide, off Newburyport Bar the west light bearing W. by S. distant 2,267 yards. Vessels bound in, over the bar, should bring this buoy in range with the west light, and run for it. This course will carry them over in seven feet at low water.

Running in on that range, a small bug light will be seen just touching the south side of the west light.

When over the bar, and half way to the shore, there will be found a spar buoy, painted black, to be left on the port hand. Then the course is N. W. $\frac{3}{4}$ W. up past a buoy in mid-channel, painted black and white perpendicular stripes, to the red buoy on Black Rocks, when it is W. $\frac{3}{4}$ S.; passing a buoy off Joppa Flats, painted black, (to be left on the port hand,) and a red buoy on Joe Noyes's Point, (to be left on the starboard hand,) to the upper mid-channel buoy, painted black and white perpendicular stripes; thence between the two piers up to the anchorage. These piers are near the city.

By order of the Light-House Board, June 15, 1855.

PUBLICATION RESPECTING THE MARKING (BETONNUNG) OF THE WESER CHANNEL.

The Chamber of Commerce of Bremen, referring to the publication of the 20th of July last, respecting the alteration in the marking of the channel of the mouth of the Weser, hereby informs all whom it may concern, that the alteration of the first Weser Key buoy, announced in said publication, has taken place:

The Weser Key buoy, lying in the mouth of the Weser (the first buoy on entering) and which was formerly painted red, has been taken away, and in the place thereof a buoy of similar form and designation, but painted black, has been laid down.

The Chamber of Commerce further informs all whom it may concern, that in consequence of the laying down of buoys, which has lately been completed, the following alterations have taken place in the marking of the channel of the Weser:—

a. The first white outside buoy in the new channel, which was marked No. 1, and which lay at the extreme point of the red lands, has been removed.

b. In place thereof a black buoy has been laid down, but somewhat more to the northward, and further inwards.

This buoy is marked A, and lies in seven fathoms in low water.

The bearings thereof are as follows:—

The steeple of Wangerooge, S.W. by W. $\frac{1}{8}$ W.
The Red A. or Pear buoy, S. W. by W. $\frac{3}{8}$ W.
The church at Minsen, S. by W. $\frac{3}{8}$ W.
The White Buoy No. 1, S.E.
The Weser Key buoy, W. $\frac{3}{8}$ N.

Ships coming from the northward, and sailing toward the Black Buoy marked A, will have to steer their course S.E. from this buoy through the new channel.

c. The white buoys formerly marked with numbers 2, 3, 4, and 5, are now marked with numbers 1, 2, 3, and 4.

d. Northeasterly from the White buoy No. 1 (formerly No. 2) lying in the new channel, a Black buoy has been laid down.

This buoy is marked B, and lies in six and a half fathoms at low water.

The bearings are as follows:—

The steeple of Wangerooge, W.S.W. $\frac{1}{8}$ W.
The White buoy No. 1, S.W. $\frac{3}{8}$ W.
The church at Minsen, S.S.W. $\frac{1}{2}$ W.
The Black buoy A. W.N.W. $\frac{1}{4}$ W.

LIGHT ON ALCATRAZES ISLAND, SAN FRANCISCO.

Notice is hereby given, that the light on Alcatrazes Island, San Francisco Bay, will be displayed at sunset on the 1st of June next, and will be continued thereafter

The light is a fixed harbor light, from a Fresnel illuminating apparatus of the third order. It illuminates the whole horizon, and is 160 feet above the level of the sea, and can be seen from sea at a distance of 12 miles off the Heads in clear weather.

J. G. BARNARD,
Brevet Major U. S. Engineers.

SAN FRANCISCO, May 19th, 1855.

BELL BOAT NEAR GRAVES LEDGE, BOSTON BAY.—Notice is hereby given, that on the 22d inst. an iron bell boat was anchored near Graves Ledge, in Boston Bay, to warn vessels of their proximity to the ledge. The bell weighs 500 lbs. It will be sounded by the action of the sea; is hung 12 feet above the surface of the water, and can be heard at the distance of about one mile.

The boat is painted black, and on both sides of a frame above her, the words "Graves Ledge" are distinctly painted in white letters. She is anchored with 30 fathoms of chain in about ten fathoms water; and when riding with the wind at N.E., Boston light bears S. 25° W.; Long Island light, S. 62° W.; Great Fawn Bar buoy, W. 8° 30′ S.; Nahant Hotel, N. 22° 30′ W.; Deer Island beacon, S. 80° W.

By order of the Lighthouse Board, June 26th, 1855.

A new lighthouse has been erected on the north end of Gardiner's Island, N.Y., about 200 yards from the Point, in lat. 41° 08′ 30″ N., long. 72° 9′ W. The house is of brick, one and a half stories high, with a circular tower attached to the north end, painted brown. A small pressed glass lens, of the Brooklyn Flint Glass Co.'s manufacture, illuminating the entire horizon, will be placed in the lantern temporarily, and a fixed white light exhibited at sunset on the evening of the 1st of August next, and nightly thereafter, from sunset to sunrise, until further notice.

The light is 30 feet above ordinary high water, and should be seen by an observer 10 feet above the level of the sea, 7 nautical or 8-37 statute miles.

It is designed to place a fifth order lens of the Fresnel system, to illuminate 315° of the horizon, in the lantern, as soon as it is received from France.

By order of the Lighthouse Board.

NEW-YORK, July 10, 1855.

BUOYS IN SAN FRANCISCO BAY AND TRIBUTARIES—ANITA ROCKS.—A spar buoy, painted red, with even numbers, has been placed in three fathoms water, about a half cable's length due west from the shoalest part of Anita Rock. Vessels should not approach this buoy within a cable's length, as a strong current sets across the rocks.

SOUTHAMPTON SHOAL.—A spar buoy, painted red, with even numbers, has been placed on the S.W. end of this shoal in 2½ fathoms water. Vessels bound up the bay should leave this buoy on the starboard hand, and avoid ranging it with the eastern end of Yerbo Buena Island.

INVINCIBLE ROCK.—A spar buoy, painted with *red and black horizontal stripes*, has been placed on the north side of this rock, in three fathoms water, about half a cable's length from the shoalest part of said rock. Vessels should not approach this buoy in any direction nearer than the distance of one cable's length.

COMMISSION LEDGE.—A spar buoy, painted with *red and black horizontal stripes*, has been placed on the west side, close to said rock, in 2½ fathoms water. Vessels should not approach this buoy from any direction nearer than the distance of a half cable's length.

LOWER MIDDLE GROUND (SUISUN BAY).—A spar buoy, painted black, with odd numbers, has been placed on the south side of this shoal, in 2½ fathoms water.

A large can buoy will be placed on San Francisco Bar, properly colored, of which due notice will be given.

NOTE.—The courses and bearings are magnetic. Red buoys, with even numbers, must be left on the starboard hand. Black buoys, with odd numbers, must be left on the port hand. Buoys with black and white perpendicular stripes are

in mid-channel, and may be passed close to, on either hand. Buoys with red and black horizontal stripes are on obstructions, with channels on either side of them.
Other distinguishing marks are additional and special.
By order of the Lighthouse Board.
SAN FRANCISCO, CAL., April 6, 1855.

LIVERPOOL, June 12.—The Ellerslie, which arrived in London yesterday from Buena Ventura, fell in with a heavy pack of ice, April 2, lat. 52 S., lon. 42 W., extending 120 miles to the northward. Same day passed an island, showing remarkable peaks, not laid down in the charts.

ANOTHER ST. JOHN CLIPPER.

THE ship "Silistria," Capt. Anthony, owned by George Thomas, Esq., of St. John, N. B., recently made the passage from Newport, Wales, to Valparaiso, about 9,000 miles, in 69 days, said to be the shortest ever made by a sailing vessel between those ports. She had a cargo of coals, and was drawing 21 feet of water.

The "S." was built at Carleton, St. John, by Messrs. I. J. & G. W. Olive, and her performances are creditable to them. Will they be so enterprising and generous as to furnish us with a tracing of her "lines," or mould-loft tables, for publication in the NAUTICAL MAGAZINE? We shall be obliged to any of our friends at a distance, if they will not be at all backward in sending us their vessels for publication. If they will bear in mind that the merchants of Europe and America are now able to get information of ships and ship-builders, through the medium of our pages, we think it will require no argument to persuade them, that it is for their interest to show a good ship at least once or twice a year. Ship-builders having vessels on the stocks, designed for a market, cannot do better than furnish us the lines and description, specifying improvements, &c., to be served up to the eye of hundreds of merchants among our readers. On this head it is unnecessary to offer anything more to men of business talents. It is only fair to presume that such parties will appreciate our efforts to a sufficient degree to become readers and supporters.

But, before concluding, we will add, that parties building for sale can find no better medium for advertising their vessels than in the fly-leaves of this magazine, inasmuch as our circulation is to every part of the Union the British Provinces, and Europe, and reaches the very class of men who purchase ships.

SHIP-BUILDING is beginning to recover slowly from its recent low depression; but very few vessels are building for the market—the demand for vessels being confined to peculiar services, and on owners account. When better times come, it is to be hoped further improvement will be made in construction and in price, and fewer but better ships be built.

DISASTERS AT SEA.

STEAMERS.

Lexington, running on Ohio and Mississippi rivers, was blown up July 1st, many persons wounded and killed.
Kentucky, was consumed on the Rock river, at Rock Island.
Prairie State, was consumed on the Rock river, at Rock Island.
Cataract, (propeller,) run ashore in the Straits of Mackinac, near Lake Michigan.
Magnolia, was burned on the Mississippi, below Baton Rouge, 8 lives lost.
J. W. Brooks, (propeller,) Cleveland for Ogdensburg, blew up near Ashtabula, July 6th, 2 lives lost.
John Stephens, was burned at Whitehall landing, near Bordentown, New-Jersey.

SHIPS.

Ellen Wood, at Key West, June 10, after being twice on a reef, not much damaged.
Cyane, (U. S. sloop-of-war,) grounded on the Colorado Reef, May 31, not much damaged.
Blanche, (Br.) Liverpool for New-Orleans, was abandoned, May 24, lat. 16, lon. 19 48.
Bonaventura, from Liverpool, is reported, June 28, ashore in Seven Island Bay.
Cora, (Spanish,) at Charleston, June 28, in a leaky condition.
Star Republic, New-York for Galveston, destroyed by fire, July 1, 320 tons.
Amethyst, Quebec for Greenock, ashore on N. E. of Green Island, July 5.
Leavitt Storer, New-Orleans for Vigo, totally lost early in June, at Sandy Cay, Grand Bahamas.
Stephen Larrabee, Liverpool for New-Orleans, got ashore, June 21, on Mozelle Shoal, Bahamas
Rockland, at San Francisco, from New-York, lost bowsprit, spars, sails, &c.
Madras, (Br.) Liverpool for Eastport, put back leaking.
Manilla, New-York for London, was aground on the bar at Sagua, June 29.
Unknown, was passed lat. 37 40, lon. 47 36, dismasted and abandoned.
Grecian, put into Lombock, April 6, having been on fire.
Paguita, of Bilboa, was in contact with unknown vessel, May 21, and abandoned.
Megunitcook, at Rio Janeiro, took fire and was scuttled and saved.
Venice, James River for ———, put into Hampton Roads, July 17, leaking.
Wizzard, at Canton, May 7, grounded on a sand bar, and will have to be recoppered.
Unknown, was seen, July 11, apparently just come off Alligator Reef, (Fla.)
Henry Grinnell, Marseilles for Madras, went ashore, June 18, in Sandy Bay, near Gibraltar.
Kensington, Savannah for Liverpool, sprung aleak, July 8, and put into New-York.
Fanny Forrester, Callao for Liverpool, ashore on Long Bank, near Liverpool, June 9.
Metropolitan, at San Francisco from New-York, capsized at the wharf, June 1, built too deep.
Akbar, Valpariso for Boston, put back, June 1, leaking.
Eliza F. Mason, (whaler,) was set on fire in the hold by some of the crew, Dec. 16, damage trifling.
Susan E. Howell, at Baltimore from Callao, leaking badly.
Unknown, about 1500 tons, was ashore, June 22, at Point de Roche, Canada.
Muscongas, at Baltimore, was in contact with a ship near Fort McHenry.
Jupiter, Trapani for Arendal, in contact with a ship, lost cable, anchrs, &c., June 10.
North Carolina, Chinchas for Valéncia, is reported as lost in Straits of Magellan.

BARQUES.

Nazarine, for New-Orleans, grounded on Madame Island Point, lost false-keel, June 14.
J. W. Coffin, was passed off Martin's Industry Light House, capsized and abandoned.
Peri, at Portland from Havana, in contact with bark Girard, lost bowsprit, &c.
St. John, (Br.) of Glasgow, was in collision with ship Mary Bannatyne.
Raymond, (Br.) London for San Francisco, put into Montevideo, April 14, making 14 in. per hour.
Unknown, of New-York, was seen, May 31, lat. 39 31 N., lon. 37 8 W., water-logged and abandoned.
Shirley, at Baltimore from Callao, sprung mainmast, May 29.
Unknown bark or ship was seen, June 7, ashore on east side of Island of Mariguans.
Race-Horse, New-York for Boston, went ashore, July 9, on the Hedge Fence, Vineyard Sound.
Chieftain, at Boston from Cienfuegos, lost foretopmast, June 24.
Hesper, from the Clyde for Cadiz, got ashore on Burr Isle, coast of Ireland.
Peter Clinton, for Havana, put into Key West, July 4, dismasted.
Peter Clinton, Havana for Hamburg, put into Key West, leaking, had lost some spars.
British Yeoman, in the Harbor of Akyabs in collision with 2 vessels, lost spars, &c.
Sarah Chase, Buenos Ayres for Brazil, was in contact with a ship, lost bowsprit and topgallant mast.
Gen. Hubbard, at New-York from Cardenas, was struck by lightning, June 22, injured spars.
Royal Saxon, Callao for U. S., put back leaky.
Nacoochee, Pensacola for New-York, was abandoned in a leaky condition, June 19.
Chase, at Key West in distress from New-Orleans, will sail for New-York.

BRIGS.

Henry Nason, at New-York from Rio Grande, lost some spars, sails and rigging, June 15.
Carlann, at Boston from Philadelphia, was in contact with a schooner, June 12, lost bowsprit.
G. W. Brinkerhoff, Xibara, Cuba for New-York, totally lost, June 19, on Key Lopez.
Nancy Plaisted, Madeira for New-York, went ashore, June 24, on Fire-Island.
Sarah Bernice, at New-York from Savannah-la-Mar, W. I., June 24, struck by lightning.
Unknown, was seen ashore on Alligator Reef, Fla., July 7.
Bonnie Bird, six months old, was abandoned, June 3, about 12 miles N. by E. of St. Johns, Fla.
Brenda, Woosung for Hong-Kong, sunk off the Rugged Islands early in March, crew saved.
Mary H. Chappell, Philadelphia for Mobile, sprung aleak, and was abandoned, June 11.
Louisa and Margaret, St. Thomas for Laguayra, was wrecked, June 12, in the Caribbean Sea.
Zoroaster, at Boston from Valparaiso, off the Falkland Islands, lost spars, sprung aleak, &c.

SCHOONERS.

E. Brainard, for Norwich, was sunk by steamer Worcester, June 17, two hands lost.
Friends, Washington, N. C., for New-York, ashore below Chickamicomico, Va.
James N. Mueir, for Baltimore, was totally lost, May 31, at Mayaguez.
Pearl, June 15, was in contact with sch. Louisine, lost bowsprit, cutwater, &c.
Hope, was found abandoned, she had evidently been in collision.
Senate, Jersey City for Plymouth, went ashore, June 26, at Gay Head, in a fog.
Ann Denman, Eastport for New-York, struck a rock and sunk near Jonesport, June 19.
Philanthropist, Bangor for Boston, put into Portland, had boat stove, &c., June 30.
A. R. Wetmore, St. Mary's river, Geo., for Trinidad, put into Island of Guadaloupe in distress.
Unknown vessel, about 200 tons, was passed lat. 30 50, lon. 67 24, masts gone above deck.
Sanop, Bangor for Providence, was seen, July 8, waterlogged and abandoned.
Anna Hincks, Rio Grande for Cork, grounded on the bar at Rio Grande, April 26.
Messenger, Liverpool, N. S., for Salem, sprung aleak and was towed to Boston, July 9.
Louis Walsh, Calais for Portland, lost part of deck load, July 3.
Anna, at Gloucester, in contact, June 26, with ship Montreal, lost bowsprit, foremast, &c.
N. C. Harris, at Holmes Hole for Boston, in contact, July 10, with unknown sch. in Vineyard Sound.
Baltic, June 15, went ashore at Campo Bello Island, N. B., vessel badly damaged.
Eliza Frances, James River for Thomaston, was abandoned, June 10, with loss of deck load, house, &c., afterwards towed into port.
Niagara, was fallen in with 45 miles S. E. from Cape Elizabeth, had only foremast standing.
North Carolina, Bangor for Boston, put into Gloucester leaking badly, had been in collision.
Challenge, Boston for Jeremie, June 13, lat. 37, lon. 68, was capsized, one man lost.
Louisa and Margaret, St. Thomas for Laguayra, was lost on the Roccas Keys about June 16.
Forest, Wilmington, N. C., for Xibara, Cuba, lost near Long Key, early in June.
L. H. Nickerson, Philadelphia for Boston, in contact with sch., June 22.
Invincible, at Portland for Bangor, sprung rudder July 11.
Westport, of Boothbay, was seen, June 19, dismasted, on fire, abandoned.
Unknown, or brig, was seen, June 20, lat. 43 34, lon. 32 12, dismasted and waterlogged.
Emma, New-York for Central America, totally lost on the Caricas Reef, June 18.
Medgee, was found, June 25, on the lakes abandoned, bow 10 feet under water, and stern out of water.
Mansfield, Milwaukie for Oswego, was run into and sunk 80 miles from the Manitou Islands.

MISSING VESSELS.

Brig September, of Orleans, sailed from that port July 17, 1854, for the Atlantic Ocean, and has not been heard from.

Schooner Virginia, also of Orleans, sailed from that port April 19, 1854. On the 20th of July following, she was reported, no lat., &c., with 70 bbls. sperm oil, since which she has not been heard from.

Brig Zoroaster, Curtis, sailed from Valparaiso, Nov. 10, for Boston, has not since been heard from. She was quite an old vessel, of about 200 tons, but had been newly topped about six years since, was well found; formerly a New-Bedford whaler; probably still had New-Bedford on her stern; cargo consisted chiefly of copper and copper ore.

Galway, June 2.—American schooner Jenny Stockton, Loud, of and for Baltimore, cargo iron, sailed hence, Jan. 28, and has not since been heard from.

Schooner Sea Bird, New-York for Key West, out 60 days, and not heard from.

Commercial Department.

THE WASTE OF WEALTH AT SEA.

"Fortunately no lives were lost."—*Public Press.*

Among the many calamities that fall to the sad experience of communities and individuals, the loss of human life weighs heaviest upon the sympathies of mankind. Whatever be the form of the catastrophe, whether famine, war, or pestilence—conflagration, flood, or shipwreck—the appalling news harrow up broad fields of grief and commiseration. The sacredness of human life is thus daily impressed upon our minds, and cannot be too deeply felt by states or individuals. Yet, the awful and neglected lessons of human sacrifice which have been taught experimentally to every generation, from time immemorial, bears indubitable testimony of man's undeveloped spirit, and shows the narrow diameter of his ambition to elevate the plane of his existence.

In the pursuit of life, liberty, and happiness—the three grand cardinal wants of humanity—the toils of human effort have ever been most signally blessed. It matters not whether the citizen, the soldier, or the sailor, the physician, philosopher, or philanthropist, have been interrogated on the mysteries of their sciences, mankind have ever held them in revered remembrance for their responses to the public weal. This is well. All honor to each noble soul who saves a life from premature death, whether the humane deed be accomplished by the valor of heroism, or by the light of science.

But the rescue of a drowning man, or of the perishing sufferer, from the devouring jaws of death, is not all of success in achieving the amelioration of humanity. The salvation of Property is equally essential to the common welfare. Let us consider the uses of wealth, which is neither more nor less than the treasures of rewarded industry.

Population without wealth, exhibits the spectacle of life without either liberty or happiness, in an enlarged sense. To a man of the present age who is qualified to honor his generation, a

condition of mere prolonged existence offers no adequate satisfaction for its continuance, and life fails to prove the blessing designed by the beneficent Author of being. The reward of labor, and the consequent possession of wealth, forms the only true basis of either individual or national well-being, as it is manifested in freedom, intelligence, and virtue, which give greatness to their favored possessors. For a man is great just in proportion to his usefulness, or his power to minister to some of the various wants of humanity. Without wealth it is impossible for some of the best minds of the race to render themselves useful to the world. There is a fountain of genius which lies dormant in many a brain, and is never revealed to the world, because the disabilities of circumstance have denied it the field and the instruments for activity. That glorious day has not yet dawned in the history of man, when his material possessions have reached a commensurate altitude with the opulent stores of mind. The wide world is to-day degraded in comparative beggary, because the transcendent capabilities of human intellect have not yet been cultivated, so as to yield the full fruits of human freedom in the line of individual capacity.

Nor has the world ever yet witnessed the united efforts of any considerable portion of men to improve the condition of mankind upon common sense, or sound scientific principles. All such attempts have been desultory and misdirected; yet they have served to record the aspirations of good men striving to attain to a more exalted condition of life. But experiments like these may perish, yet the ideas which warmed them into being will rise again from their ruins. The first step is *to try.*

It is from reflections like these, which have often weighed upon the mind of the practical philanthropist, as well as the individual seeking out his own sphere of happiness, that we arrive at the conclusion, that wealth underlies all substantial progress. The treasured fruits of industry being wanting, there is no firm fulcrum for advancement. The mental degradation of the savage exactly corresponds to the paucity of his possessions; and without first creating wealth, it is impossible for him to advance in the development of his powers, and in the consequent enjoyment of increased liberty and enlightened happiness. He

is environed on every side with disability, and is, therefore, restricted to the narrow footpaths of his predecessors.

Wealth is, therefore, the lever of talent, the arm of independence, freedom and progress, individual or national. It is for this reason that the human mind instinctively defers to the possessor of material goods, and struggles to acquire the same power for itself. Hence the reason why the man who "makes two blades of grass grow where but one grew before," becomes a benefactor to his country; why every labor-saving invention should be hailed with joy; why every discovery in science, and every improvement in art, should be received by mankind with a grateful welcome. All these are the multipliers of wealth, and new levers for the elevation of humanity. Every idea in science, which is made practical in art, may be rendered a blessing to the entire race.

We have now arrived at a period in the history of the enlightened countries of the globe, when invention and improvement correspond to the pace of the locomotive; when the powers of genius have become as supple as the elastic steam, and as industrious as the unfailing engine. The productive capabilities of the human mind now increase from year to year at a rapid rate in comparison with the dull progress of preceding ages. New fields for enterprise spring up in every quarter, and multiplied facilities for business make toiling beings of us all. A man without business is now excluded from the world. These are the times when the noise of a battle is scarcely heard above the hum of industry.

The people of the United States, perhaps, more than any other in the world, are a wealth-seeking people. Possessing within their own boundaries every necessary element of prosperity, and, therefore, the centre of attraction from every clime of civilization, they appear destined to reach an *ultimatum* in human progress grander than any that ever before awaited any portion of the race. The general diffusion of wealth among the masses of our people, and the consequent diffusion of knowledge, and freedom, fully sustain this conclusion; therefore, let wealth be multiplied and abound. It is the only key to the substantial development of mankind. With plenty will come independence

—with independence, freedom—with freedom, wisdom—with wisdom, fraternity—and with fraternity, other blessings.

But we come at last to the consideration of the means of wealth. Some of these we have already pointed out, as the results of man's inventive genius in every department of industry. It is not our purpose, however, to enlarge upon this branch of the subject. We desire to project a thought upon the commercial world, in relation to the WASTE OF WEALTH, in marine losses, occasioned by daily recurring disasters at sea. The enormous sacrifice of property from this cause alone, exceeds all belief. The underwriters' books in the United States, or in Great Britain, show but an imperfect reckoning.

If conflagrations and marine losses could be avoided for a period of twenty-five years, what a vast saving of wealth would accumulate! Not all the "tariffs" or "free-trades" that legislators have ever enacted would so greatly promote the prosperity of the country. It is not all of thrift to *earn*. Fortunes are rarely or never amassed except by *saving*.

"FORTUNATELY NO LIVES WERE LOST," is the humane exclamation of our people, when a richly freighted steamer sinks by a stroke of collision, to the bottom of the sea, and the mariners escape. Without refusing to administer the common sympathy of our nature, we cannot refrain from the suggestion, that such accidents have a financial as well as a vital significance. That manly maxim which enjoins upon the sailor the duty, "never to give up the ship," except inch by inch, to the devastating elements, has a foundation in sound philosophy and wise maritime economy. When the frail bark of commerce is driven by the violence of the gale upon the surge-beaten rocks of a lee shore, it is again said to be "fortunate that no lives were lost," if all hands escape. Thus it would appear only a very slight catastrophe to lose a valuable ship and cargo; but if one poor seaman slips from his hold on the spar, it immediately becomes an affair of sympathy. Had the same individual closed his sublunary career in a quiet and noiseless manner, his end would have produced no emotion, as we would then have had no vivid associations to recall his memory and his struggles. None would have cared for either. The loss of a few thousand human

beings, more or less, by some of the prevailing causes of mortality on shore, is nothing thought of, and entails but little loss upon the community, in comparison with the marine disasters of the year.

Yet philanthropic societies have found their way into organized efforts to save the mariner, while the ship has been *insured* and left to her fate. "Unlucky craft" is she, if dishonored by premature wreck! "Unfortunate mariners" they, who may be swallowed up in the engulphing sea! What is the remedy? We answer, TO SAVE THE SHIP.

No lives will be lost while the ship is safe. Then *save the property, and all will be right.* There is room for a vast amount of improvement yet to be made, not only in navigation, but ship-building, before the so-called "Dangers of the Seas" will be reduced to their proper dimensions. It is the dangers of the *ship,* the errors and blunders of the builder and navigator, together with the imperfect condition of our knowledge of mechanism and navigation, and the want of the most suitable means of conducting those operations and evolutions, that we may more properly ascribe the casualties in navigating the ocean. To the study of these obstacles, the maritime world should most perseveringly direct their investigations. An enlarged view of the commercial arena will disclose this truth, that, in proportion as we *extend* and increase our wealth in shipping, upon every sea of the globe, for transporting the merchandise of many nations, so we must secure our ships against disasters; otherwise our annual losses of marine wealth will grow to an enormous amount.

As a commercial nation, there is no line of policy which could be pursued, so vital to the husbanding of wealth, and not less so to the prospective earnings of our commercial marine, as one which would aim at the improvement of shipping and navigation on a scientific and enlarged scale. Why should we be content to *waste* our industrious toil by a system of profligacy in the manner of constructing ships and sailing them? If commercial operations are not worth doing well, when carried to the extent which they now are in the United States, where shall we find the exception to a very loose rule? Any-

thing that can be insured, (and pray what cannot be, by means of bantering rival companies ?) carries our property and fellow-citizens out upon the deep, where it wallows and sinks! When we consider what a small proportion of vessels are condemned in port, compared with the number lost at sea, and cast upon the strand, we may form a crude idea of the recklessness of commercial adventurers.

If a vessel "spring a leak," the chances frequently are, that she will be abandoned; if a "collision happen," one or both are likely to sink; when a gale or a hurricane overtakes the mariner, he is often liable to be crippled, or to founder; and such a clumsy adaptation of model and propelling power so often obtains between the ship and the ocean, that an apparently staunch vessel proves to be but a fragile wickershell, to be shaken into pieces. Insurance is not safety, albeit, some owners hang their fortune upon this delusive faith, and drive forward .upon each desperate adventure at other men's risks, where they would not venture the value of a dollar upon their own. A system of marine insurance, to be as valuable to the *community* as the present one now is to certain classes of ship-owners, must have a basis in equity, instead of in chance, for it is notorious that Insurance Companies now insure quite as much against the imperfect survey of their own agents, and the reckless construction of builders, to say nothing of defective models, clumsy rigs, and careless management, as against the few and simple "dangers of the seas." These may be immeasurably narrowed to a *minimum*, under a wise and equitable system of insurance. The discreet owner, who places his fine vessel under the command of an able and worthy commander, pays the same tax to the underwriters that is demanded in a case where these conditions are reversed; and the first vessel may sail on the same voyages, until fairly worn with age, whilst the second may be lost on the first voyage which she makes. Thus, in the adjustment of losses, and establishment of profitable "rates" of insurance, the prudent owner is necessarily taxed for the benefit of the imprudent and reckless. We say, therefore, that there is a vast field of usefulness for the *underwriters* of the United States, in which they may promote the maritime

economy of our country, while their business would be rendered less hazardous, and their dividends more certain. In a future article we shall take occasion to enlarge upon this topic.

The eradication of all these evils lies in the improvement of ship-building, and navigation, and progress in every other department of maritime enterprise. The disastrous waste of labor upon the seas, involves, first, an appalling loss of life; next, the loss of vessel and cargo, and subsequently a loss of character, for security against the dangers of navigation. Let those who possess practical wisdom, in addition to philosophy, which is often only another name for enlarged selfishness, grasp the question by its extremities, and endeavor to elevate the public conception of its magnitude and importance, and it will not be long until the waste of marine wealth will exhibit a diminishing ratio.

This question is one of the greatest for the legislators of our country; but its discussion has never yet been provoked. What can be done to render life and property more secure upon the ocean? is indeed a statesman's problem. The true answer, and the only one worthy of a comprehensive mind, is short—here it is—*perfect the model, construction, and propelling power of vessels,* and extend Lieutenant Maury's researches and investigations, until every obstacle shall be removed to the safe and certain navigation of every water on the globe. Nor would we lose the opportunity here to say, that what this excellent officer and citizen is doing for the navigator, *may be done by competent investigators of the model, propelling power, and performances of the ship itself, for the shipowner and underwriter.* The laws of profit and loss, as they reside in the qualities of vessels, *are yet undiscovered.*—What, we ask, could be of greater interest to the commercial man, than a knowledge of those laws? In conjunction with the labors of Lieutenant Maury, a scientific ship-builder, with a similar corps of assistants, would do more for the marine excellence of the United States, and the world, in a period of five years, than has yet been done by our native genius and enterprise during the last quarter of a century. Nay, a period of ten years would be well spent in analysing the causes of disaster

and ruin, and the causes of success, mechanically, nautically and commercially. What a vast *field* for investigation, and how invaluable would be the results!

But we close our remarks, adding only a brief statement of our idea in these words—*let us save our ships.* It is well to insure them, but better to save them; and saving them will also save the lives on board. A mind that can readily grasp the ideal bulk of a body of water, exceeding in any considerable degree the insignificant magnitude of a duck-pond, will, no doubt, be able, on reflection, to comprehend the force of this suggestion. We hope the time is drawing near, when it will be doubly "fortunate" that neither "life" nor *property* "were lost" by venturing abroad upon the glorious sea, while it is exchanging equilibriums with the atmosphere; and when we shall build better vessels at the same cost,—*for use, and not for waste.*

SYNOPSIS OF THE TIMBER TRADE AT QUEBEC.

We had the pleasing duty of alluding to the increasing and prosperous trade of our port last year; and we feel equal pleasure in recording another great increase this year; but we fear it will not be attended with the same prosperous results as that of the last.

This year's business opened with very flattering prospects; our great staple—timber—commanded a high price in the English markets, and continued to do so for a considerable time after the business season had commenced. This state of the markets induced large speculative shipments to be made, and the consequent great demand for ships run up freight from 52s. to 60s. for Timber, and £7 10s. to £8 10s. for Deals; and these rates were continued for some time, when a reaction took place in the English markets, and the price of timber began to recede, and continued to that extent, as to stop its export, except it could be shipped at a mere nominal freight. The consequence was that freights fell at the close of the season to 22s. 6d. for Timber, and £3 10s. to £4 for Deals, and in this view of an exor-

bitant high price for labor, coupled with unusually high prices for provisions, which must have so increased the disbursements of ships as to cause heavy losses in many cases to the owners.

The total number of vessels, of all classes, from without the Province, which arrived here this year, was 1563, forming 600,838 tons. Of that number 1385 entered here; and 178 passed on direct to Montreal.

The total number of vessels, of all classes, which arrived at Montreal this year, from without the Province, was 254,—forming 80,892 tons. 98 of these vessels returned to Quebec in ballast to load; and 27 came down partly laden, and completed their cargoes here. 166 of the above vessels were foreign, viz.:

Norwegian................	63	vessels.	24,884	tons.
Prussian..................	18	"	7,084	"
German..................	7	"	2,652	"
Swedish..................	4	"	1,356	"
Austrian..................	1	"	195	"
French..................	2	"	455	"
Spanish..................	1	"	211	"
Portuguese................	16	"	2,871	"
American................	54	"	41,539	"
	166		81,447	"

Five of the above vessels were registered here as British. 34 foreign vessels, viz., 7 Norwegian and 27 American, forming 26,730 tons, loaded at the Saguenay, Father Point and Cape Chat this year.

In addition to the above large amount of tonnage, there were built and registered in Quebec during the year ending 1st instant :—

43 square-rigged vessels, forming............	44,165	tons.
25 Schooners "	2,625	"
8 Steamers, "	518	"
76	47,308	

Total number of vessels, of all classes, which cleared at this port during the past season, was 1504—aggregate tonnage, 664,345 tons.

TRADE TO THE LOWER PROVINCES; THAT IS, NOVA SCOTIA, NEW BRUNSWICK, NEWFOUNDLAND, CAPE BRETON, PRINCE EDWARD'S ISLAND AND LABRADOR.

Clearances at this Port for the above Provinces from 1849 *to* 1854.

1849............	153 vessels............	8,728 tons.
1850............	165 "	10,119 "
1851............	160 "	12,683 "
1852............	156 "	10,490 "
1853............	196 "	12,797 "
1854............	148 "	9,832 "

These vessels were employed in the transport of Flour and Provisions to the above Provinces; and in return brought back coal, fish and West India produce.

Number of Vessels that have cleared at this Port for each of the above Provinces.

	1853.				1854.			
New Brunswick....	104	vessels.	5617	tons.	76	vessels.	4179	tons.
Nova Scotia.......	46	"	2777	"	27*	"	1989	"
Newfoundland.....	34	"	3575	"	24	"	2336	"
Cape Breton........	5	"	304	"	10	"	683	"
Labrador..........	7	"	244	"	9	"	535	"
Prince Edward's Island,	4	"	176	"	2	"	110	"
			12,694		148		9,832	

It will be seen by the above, that there has been a very considerable falling off in the exports to these Provinces this year. Two causes have operated to produce it. The first is, that the high price of flour has no doubt had the effect of curtailing its consumption. And the second is, that the exports from Montreal to these Provinces, have very much increased this year.

There has been a slight falling off in the exports to the settlements and lumbering establishments in the gulf, (within the Province.) The high price of flour, and the low price of fish this season, is the apparent cause of this falling off.

The disasters have not been numerous, considering the great number of vessels that have visited Quebec this year. 40 sail, coming to or going from here, are reported as having either

* 20 of these vessels cleared for Halifax.

foundered or been abandoned at sea; and a like number has been stranded in the gulf and river, during the past season. The whole of the latter number, we regret to say, with the exception of two or three, have been condemned and sold for account of the underwriters. The loss of life, we are happy to say, has been small, not over twelve or fifteen persons are known to have perished by these wrecks.—*Quebec Morning Chronicle.*

THE STEAMBOAT METROPOLIS.

Since the issue of the last number, the Junior Editor of the MAGAZINE has enjoyed the pleasure of a trip to Fall River, on board this magnificent vessel, and was highly pleased not only with her performance, but with the attention and politeness of her officers. Having given place to a full and complete exposition of the engineer's department of the *Metropolis*, from the pen of her competent designer, Erastus W. Smith, together with a general description of the varions improvements adopted in the construction of hull, and the arrangement of cabins, we had thought it entirely unnecessary to add a single remark, either in extension of particulars, or as corroborative of the excellent description already referred to. But having our thoughts directed to the model of the *Metropolis*, which we had understood to be an improvement upon those of the *Bay* and *Empire States*, we ventured to remark, that Mr. Smith, in comparing the *performances* of those boats, apparently had left out of view any improvement of shape in it.

We regret to say, that the intent and meaning of our remarks have been misapprehended—the performance or speed of the *boat*, to which we alluded, having been confounded with the performance of the engines, and the excellent results obtained from the boilers in the economy of fuel. So far as the fact regarding the superiority of the model is concerned, we are of opinion that a small difference is perceptible in its favor, while the enlarged displacement and extra speed, with an equal consumption of coal, shows, indeed, an extraordinary result consequent upon engineering skill.

In our remarks, which were, perhaps, too brief to do justice to our ideas, it was not our intention to impair the force of Mr. Smith's disquisition, but only to apprise our readers that improvements in the *model* of this fine boat had likewise been made by the builder. And lest our remarks concerning the importance of calculating the displacement and resistance should be thought especially pertinent in the present instance, it is only necessary to say, that those calculations are seldom resorted to, and therefore never presented in popular articles, however desirable they might seem to the scientific student. For this reason Mr. Smith did not think it necessary to enter into them on this occasion. And notwithstanding the correctness of our remarks, they were not designed to have especial pertinence to the *Metropolis*.

☞ Reports of ship stock, and some other articles, have been unavoidably crowded out of this number.

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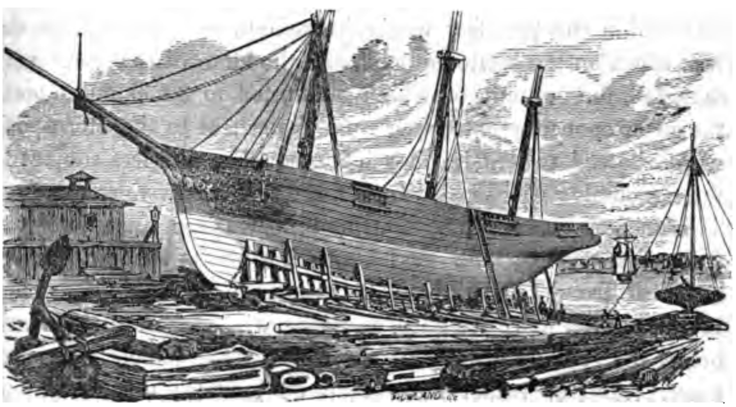


STABILITY IN VESSELS.

THIS important problem is interesting in every aspect in which it may be presented to the student of nautical science. The present age is more at fault upon this department of maritime philosophy than upon any other, consequent upon its having failed to improve upon, and profit by the most practical illustrations, furnished in the vessels themselves. We have been furnished with one of the best elucidations of this (to many minds) abstruse question, that we have ever witnessed, in the

steamer Eldorado. This vessel was built in 1850, is 225 feet long, 30.83 feet wide, and 23 feet deep, and has two working beam engines of 50 inch cylinder, 10 feet stroke, 30 feet diameter of wheel; she has 2 single return flue boilers, and when first completed it was found necessary to increase her breadth by building sponsons on the sides, both forward and aft the wheel, in order that she might maintain an upright position, and *without which* 300 tons of kentledge, for ballast, was found to be insufficient to secure vertical equilibrium. The vessel was thus partially loaded both without and within, and when at sea was found to be leaky, the extent of which was increased with the action of the sea at every successive voyage; but inasmuch as she was kept as a contingent vessel, it was not deemed advisable to seek a remedy, in any costly outlay, more particularly while her copper was in a sea-worthy condition. The company having had within the past few weeks immediate use for the ship, she was taken on the sectional dock, and the forward sponsons were removed, the contents of which amounted to 3,000 cubic feet; the after sponsons extending from the wheel to the stern-post, were allowed to remain, they being smaller, and less subject to the concussive shocks, to which those on the bow were exposed. This mass of timber being of white pine, was somewhat buoyant, when first put on the vessel, differing in its specific gravity but little from .720, or about 45 pounds to the cubic foot, had become much more weighty, and was, when taken off, but little below the specific gravity of the water itself, which is equal to about 1.030, or rather more than 64 pounds; this enormous weight, added to the fastenings, hanging upon the anterior part of the vessel, caused the leak complained of; the mass of timber occupying a change of position at every lurch of the vessel; being on the one side pressed upward by submergence, while the opposite one was hanging down with a power equal to its weight, and *vice versa* on the opposite roll. Strange, indeed, and paradoxical as it may seem, with this weighty mass hanging to her sides, the vessel was more profitable with, than without the sponsons, freight list considered; and but for the danger and difficulty in securing them in solid mass, doubtless they would

have remained upon her. And now we, as journalists, are called upon to furnish such information as may be available for future reference, and to furnish such practical evidence as may deter others from venturing to trifle with the laws of nature, which always accord with those of common sense. In the first place, we would inquire of any ship-builder, how much more material it would have required to have enlarged this vessel when being built on the stocks, quite out to the width of her sponsons? Certainly no builder would jeopardize his reputation by estimating more than the amount contained in the sponsons themselves; and what would have been the result? Why, just this; the vessel would have had a greater displacement, with a lighter draught of water, and a sufficient amount of stability to have maintained her vertical equilibrium without ballast, and at the same time would have been faster; here we have a clear gain of 300 gross tons of freight at every voyage, both to and from her port of destination. The term stability, as applied to vessels, we are persuaded, is not generally understood by very many of those who are intimately connected with the construction of vessels; were it not as we have assumed, we should never find *artificial* stability substituted for that of *natural*. Stability may be secured and maintained by any floating body, without regard to its dimensions; an inch board 12 inches wide may be held in equilibrio on its edge, or on its end, but this is not natural stability; it is the result of an appropriation of a certain amount of the buoyant power to obtain it. Every floating body has an amount of natural stability proportionate to its disposition to remain in the position assigned it. If a vessel, being built with bottom, sides and deck, (and designed to float on its bottom,) occupies a different natural position, it only proves that the bottom is in the wrong place, that it should have been on the side; and this is the only natural conclusion to which we can arrive;—to assume that it were otherwise, would be to suppose that vessels are built for the mere gratification of owning a species of property, from which we did not expect remunerative profit. It is not consistent with the philosophy of the age, to assume that natural stability is not in every respect the best

qualification a sea-going vessel can possibly possess? It is true, we sometimes hear men boast of narrow ships, how well they perform, how easy and regular their motions; but it is only necessary to watch the progress of events, and we discover that the next ship is built with more beam, or with a less proportion of depth. We inquire the reason, and are told that it is more profitable to carry less ballast, hence the reason of their change. This, of course, is the most convenient mode of introducing stable dimensions, or such as will keep the vessel in equilibrio on the side intended for the bottom of the fabric. It is not in accordance with the experience of any nautical man (not excepting those who advocate narrow vessels, however great their amount of experience, or widely extended their research), that narrow vessels, or such as require ballast, are subject to less *motivity* of action at sea, than wider vessels, or such as require no kentledge to keep them upright. It is not enough to say, that the vessel herself is sufficiently stable—it is only the preponderating influence of the engine that interferes with the natural qualities of the ship; we should not be unmindful that, when the engine becomes attached to a vessel, it becomes a part of that vessel, and enters into all the computations of stability or momentums. As well might the sailing ship repudiate her spars and sails, as for a steamer to throw the engine, boilers and wheels (whether side or stern) out of the calculations of stability. It is only necessary for the builder to determine the *momentums* of stability of his model, and from the engineer to learn the weight of his propulsory power with the altitude of its centre of gravity; the altitude of this weight above the centre of gravity of the vessel divided into the momentums, furnishes a solution to the problem in pounds, and if the quotient be less than the natural stability of the hull, the vessel will carry her engine and boilers, provided other incongruities do not disturb her equilibrium.

For example, we will suppose a vessel designed for a steamer to have a defined line of flotation, equivalent to the weight of hull, engine, boilèrs, etc., the *momentums* of which have been determined; we also know the weight of engine, boilers, etc.,

with the height of their centre of gravity above that of displacement. We have, then, the following formula:

		Ts. lbs.
Momentums above centre of displacement,	$\frac{4856374}{12'}$	$=404698\div2240=180.1498.$
Centre of gravity of engine,		

Now it must be clear that if the natural stability of the vessel exceeds this amount, she will equilibriate with the right side up, but if this amount is above that of the stability of the hull, the centre of gravity of the vessel must be lowered, which has the effect of increasing the divisor, and, as a consequence, reduces the effect of the force applied, by the amount of ballast put on board. The same effect is produced by increasing the *momentums,* as in the case of the Eldorado; the line of support being always vertical, the effect produced is at once made manifest, by increasing the breadth of the vessel. Inasmuch as the centre of buoyancy moves more rapidly toward the leeward side when the vessel is careened, as a consequence, its vertical intersection with the middle line of the vessel occupies a more distant relation than in the narrow vessel; and as the centre of gravity of the vessel takes a lower position, the centre of buoyancy takes up a more elevated locality, and the centre of effort a higher point of intersection with the vertical middle line of the vessel. The *momentums* are but the representation of that amount of force, which, if applied at the centre of buoyancy, would be the measure of stability at the line of flotation for which it was determined. The problem of stability is no less advantageous to sailing than to steaming vessels; and the careen, or list of a sailing vessel can be calculated by the force of the wind on the sails; and we have no hesitation in saying that the subject should engage more of the attention of ship-builders in the United States. In Prussia, this knowledge must be attained by the young aspirant before he can obtain license to build vessels for the purposes of navigation. If this test were applied in the United States, how many would be found wanting? The Eldorado carries about 300 tons of kentledge for ballast, the freight of which we have no means at hand of estimating; this, added to 145 tons of upper deck, with which she never should

have been encumbered, makes 445 tons of freight lost, or shut out of the vessel on each half of every voyage, or 890 gross tons of ship and kentledge lost on every voyage; this added to the interest of the money on the first cost, will furnish the advocates of narrow vessels with a digest, worthy of their attention.

We now ask, in conclusion (not for want of matter upon this important subject, but for want of space), if narrow vessels are superior for speed to wider ones, why has not the *Eldorado* proved herself to be faster than the *Ocean Bird*, being of the same length and depth, and with the same amount of capacity of engine? Surely, 6 feet, 2 inches difference in their breadth, is quite enough to test the disadvantages of narrow vessels, whether for *speed, burden, diminished motivity of action*, or in *almighty dollars*.

STEAMER ARAGO.

This vessel, built by Jacob A. Westervelt & Sons, under the superintendence of Captain William Skiddy, with direct reference to the service intended, and to take the place of the steamer Humboldt, is not only in size, but in other respects a first-class vessel, and is well worthy of all who have, in any degree, contributed to the construction of hull and engines, as well as to the furnishing of this noble fabric.

We have, by the enterprise and generosity of her reputed builders, been put in possession of her tables, with details of construction, and every assistance has been furnished by her generous commander, Capt. D. Lines, to enable us to investigate the tangible qualities of his ship—a protege of which he is justly proud. In the elementary principles of construction of this ship, one of the first great causes of sacifice to life and property in navigating the ocean by steam, has not been lost sight of; hence the internal arrangements for furnishing security against accident, whether by contact or collision, have not been overlooked, as in the earlier days of

ocean steam navigation; as a consequence, the hold of the vessel, as well as the lower decks, has been provided with bulkheads dividing them into compartments, thus providing against foundering in case of rupture in any one of the compartments. It is gratifying, indeed, to know that the lessons of experience are not entirely lost, either in the construction of the hull or engines. It has been the custom to set a higher estimate upon the size of the engines than upon the boilers; as a consequence, the power was determined by the diameter and length of the cylinder, rather than by the amount of steam furnished by the boilers.

The main features of her engines and boilers, with the improvements which have been introduced, will appear from the following extracts of a letter, received from the builders of her engines:—Particulars are promised for the next number.

Her engines, which it will be observed are small, considering the size of her hull, consist of a pair of oscillating cylinders, 65 inches in diameter, 10 feet stroke, having the steam-chests and passages cast upon them, with poppet-valves, controlled by Allen & Wells' adjustable cut-off gear, and so arranged as to work hooked-on, running either forward or backward. She is furnished with Pirsson's "Steam Surface Condenser," and has two drop-return flue boilers.

Her pumping engines, of which she has two very powerful ones, are supplied with steam by an independent boiler, and their exhaust steam is condensed in tanks placed in the wheel-houses, and thus furnishes a supply of fresh water for the ship. She has paddle-wheels 33 feet in diameter, to the outside of rims, and buckets 20 inches broad by 10 feet long.

The peculiar feature of these engines, however, is their connection by means of a drag-link, now first introduced in combination with oscillating engines, with a promise of highly satisfactory results.

On her trial trip she made the distance from the point of the Hook to the Light-ship, said to be seven and one-half miles, in thirty-seven and one-half minutes, and returned against a moderate breeze in precisely the same time—averaging 14 revolutions, with 27 lbs. of steam, and cutting off at one-third of the stroke.

Principal dimensions—292 feet on deck, 40 feet 8 inches beam, and 31 feet hold (three flush decks). Keel, 16 + 16 inches; keelsons, centre tier, 16 + 18; engine keelsons, 36 + 60 inches; timbering space, 30 inches, scantling, 21 inches at keel, and 6½ inches at spar deck; planksheer, straight taper: floor solid, of oak, and caulked above turn of bilge; the floors side 15 inches; the lower futtocks are of oak, and side 11 inches; the tops of tamarack, and side 11 inches; frame diagonally braced with 5 by ⅞ inch

iron, 4 feet from centre to centre, extending from floor-heads to spar-deck clamps; ceiling, in lower hold, of yellow pine; 2 strakes, 14 inches, 2 of 12 inches, and two of 10, the balance of 8 inches to lower deck; ceiling, between lower and middle decks, 6 and 7 inches; in upper 'tween decks, 5 inches, and all bolted edgewise with 1 inch iron, placed between every other frame; lower and middle decks laid with 3½ inch plank; upper deck 3 inches; planksheer, 6 by 16; main-rail, 5 by 10, oak; outside planking, 1st garboard, 10 inches; 2d, 8 inches; 3d, 6 inches; thence to turn of bilge 4½ inches, oak; from bilge to water-line, 5 inches; wales, 6 inches; waist, 4½ inches. The beams are kneed off in the usual manner, with lodge and bosom knees; bolts driven from outside, and clenched. Waterways on lower and middle deck, of 3 tiers yellow pine—1st tier, 17 inches square; 2d tier, 15 inches; 3d tier, 8 by 16 inches. Hanging-knees under all the beams, of large size, and fastened with 1 inch iron; outside plank fastened with 1¼ inch locust trenails, driven through, from keel to planksheer, and wedged. Butt bolts ⅞ inches copper; garboard fastened with 1⅛ composition, and bolted edgewise, with 1 inch iron; midship keelson, secured with copper, 1⅜ inches, driven through every floor—(no yellow metal used in ship). Engine keelsons fastened with 1¼ inch iron, driven through and clenched, 4 bolts in a frame. She has 8 oak breast-hooks forward, and 6 aft, fastened with 1¼ inches copper and iron. She has a water-tight compartment enclosing her engine, made of 2 thicknesses of yellow pine, 2 inches thick each, crossing each other at a right angle, fastened with ⅞ iron.

DIMENSIONS OF SPARS FOR STEAMER ARAGO.

	Feet.		Feet.		Feet.
Mainmast	82	steps on main deck		partners	26
Foremast	86	heads	15	"	26
Fore-topmast	46	pole off	9	"	13
Main-topmast	47	"	10	"	9
Main-yard	60	arms	5	"	16
Fore-yard	60	"	5	"	16
2 topsail-yards	48	"	5	"	12
Main-gaff	36	pole off	6	"	8½
Fore-gaff	33	"	2	"	8½
2 topmast studsail booms			34	"	7½

Capt. Lines has devoted his whole time to supervising the details throughout the ship, which are probably as complete and as commodious and comfortable as any yet fitted in this country. Commencing on the spar or upper deck, forward, are seen Brown's patent anchor gearing, stated to be the

most efficient apparatus for working cables and anchors at present known, combining strength, security, and great saving of room and labor. It was put in operation during the trial trip, at Sandy Hook, when the anchor was weighed with the greatest ease. From the foremast, going aft, are several covered stairways, leading down to the different cabins, with large skylights. By the mainmast is a house, protecting the main stairway, containing cushioned seats for passengers—abaft this is a range of large skylights, and one of Brown's patent capstans; on the after part of this deck (300 feet long) is a circular house protecting the helmsman, with a stairway to the dining-saloon, a state-room for the captain, and one for the first officer. In the centre is a sitting-room, from which is entered by folding-doors a convenient smoking-room, containing card-tables, and a private passage on each side to the water-closets. This whole deck is enclosed with locust stancheons and rail, and a galvanized iron netting, imparting a very light and airy appearance. On the outside are suspended eight large life-boats, (Francis' patent,) fitted with oars, sails, water-casks, &c.

On the main deck, commencing and descending by the stairway aft, you enter the dining-saloon, 100 feet long, with open galleries amidships, enclosed by a handsome polished railing, over which, on the spar-deck, are the large skylights, imparting light and air through these galleries down on to the next deck, with beautiful effect. A double range of hard wood polished tables, with cushioned seats, covered with crimson plush, extend the whole length of the saloon. Over these tables suspended are shelves or racks, containing the different cut glass and bottles required at table. Over each table is also suspended a beautiful French fancy lamp. The bulkheads on either side of the saloon are all of the most recherche woods, assorted and highly polished. They are intersected by alcoves with circular arches, leading to a suite of state-rooms communicating with each other. Each alcove has a large light opening through the side of the ship; also one in each state-room. These rooms each accommodate two persons with berths, sofa and toilet fixtures. Advancing forward; you pass the mainmast and stairway. On the right you enter the ladies' saloon, tastefully decorated with table, cushioned seats and mirrors. This opens into a private boudoir or dressing-room, adjoining which are three water-closets and a bath-room. Opposite the ladies' saloon is the captain's room, conveniently and tastefully fitted up. Adjoining, going forward, you enter the steward's pantry, containing bar-room, steam table, plated ware, and cases for silver, &c., &c., beautifully arranged, under the direction of Mr. Allen, chief steward. Continuing on from the ladies' saloon, through an extensive and well-lighted passage, leading forward 150 feet, are placed the ice and vegetable houses, between the side of the ship and between the paddle or guard beams, where, in all steamers, it is usually damp. These houses are entirely out of sight, and communicate with the upper deck. Beyond this

the place is occupied with state-rooms and alcoves, lighted and arranged similarly to those already described aft. At the extreme end, forward, is a ladies' boudoir and water-closet. On the left side of this passage are the engineer's room, state-rooms, barber's dressing-room, and a half circular stairs leading to the upper deck. Crossing by an alcove to the port side, a similar half circular stairway from the upper deck, conducts to the forward cabin passengers' dining-saloon, well lighted and ventilated, and fitted up with Thompson's patent life-tables. and all other conveniences similar to the after saloon and pantry. Several state-rooms extend forward of this saloon to the store-room and forecastle. Proceeding aft through a passage, either side is occupied with rooms for officers, servants, mess-rooms, galleys, ice-houses, lamp-room, butcher's and baker's-rooms, and large cabin galley, and steward's pantry.

On the berth-deck, under the main-deck, is seventy feet long, lighted and aired by the galleries and sky-lights already described. The longitudinal bulkheads are delicately ornamented and beautifully grained in oak, having side sofas, covered with crimson plush. Alcoves intersect every 12 feet, leading into the different state-rooms, all of which are well lighted and ventilated; in each room are two berths, sofa and toilet fixtures, &c., similar to those above. Rooms communicate where required by families. Beyond the forward stairway, leading up to the dining-saloon, are rooms for servants, stores, luggage, &c.; between this and forward lower cabin, the space is occupied with engines, coal, &c.; after this, descending by a stairway, between the two half circular stairs forward, you land in a similar saloon or passage to that in the lower cabin aft, with alcoves leading to state-rooms. There are water-closets on each deck, all ventilated on a new plan, with Perley's patent ventilators.

The ship is thoroughly ventilated on the outside with Perley's patent ventilators, between every frame, thus allowing free circulation to the floor timbers.

The Arago can accommodate, comfortably, 250 passengers, and carry about 900 tons of cargo, besides 900 tons of coal. Her draught, with all on board, will not be more than 17½ feet.

CALCULATIONS.

		Feet.
Length on deck		292.00
Length on load-line (15 feet above base-line)		281.53
Breadth moulded on load-line at midships		40.00
Area of load water-line in square feet	7882.00	
Exponent of the same	0.70	
Centre of gravity of same abaft mid-length		2.60
Area of greatest transverse section, sq. feet	569.25	
Exponent of the same	0.948	

		Feet.
Location of the same abaft mid-length		0.80
Moulded displacement in cubic feet	97657.5	
" " in tons gross	2790	
Total displacement in tons gross	2954	
Exponent of displacement	0.578	
Centre of gravity below load-line		6.61
Centre of gravity abaft mid-length		0.48
Moment of stability, ($s.$ 2-3 $y^3\ d.\ x.$)=	812.847	
Height of *meta centre* above centre of buoyancy		8.32
Registered tonnage	2,260	

ABSTRACT FROM STEAMER ARAGO'S LOG ON FIRST PASSAGE FROM SANDY-HOOK TO COWES.

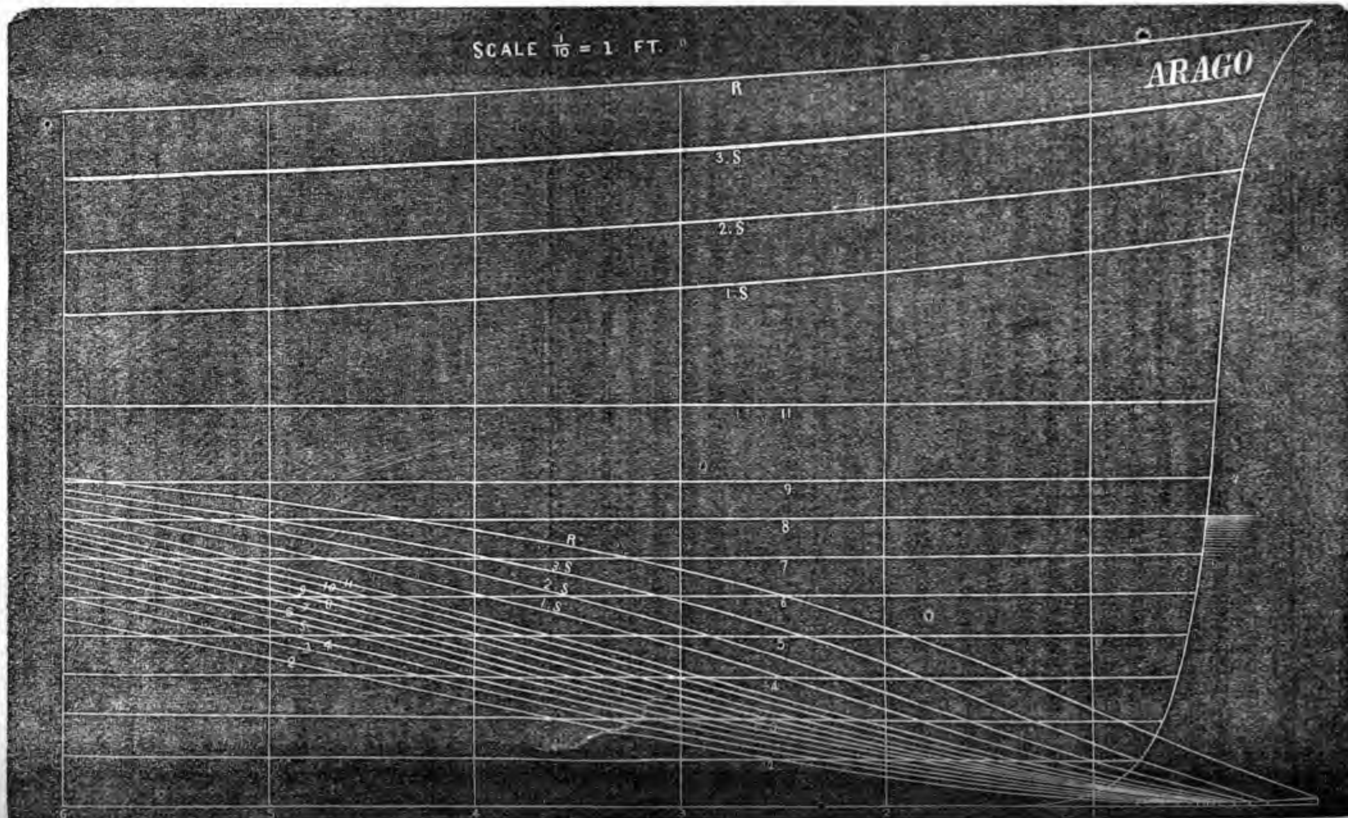
June, 1855.	Distance.	Revolutions.	Steam.	Tons coal.
3	190	15,144	30 Pas	37
4	215	15,064	30	41
5	228	17,708	30	44
6	252	19,716	30	49
7	268	19,564	30	50
8	276	19,807	30	46
9	243	20,905	30	47
10	260	20,346	25	47
11	270	21,055	30	47
12	250	20,107	22	44
13	278	21,115	25	45
14	294	22,620	25	47
15	120			
	3,144 miles.			

Stopped off Cowes, 10 P. M.; deduct 4 degs. 50 minutes for difference in time, and 5 degs. 10 min., for stoppages and slowing, leaves 12 days' passage. Thursday evening, 10 P. M., January 14, 1855.

Homeward passage, left Cowes 11 30 P. M.

FROM COWES.

July, 1855.	Distance.	Revolutions.	Steam.	Tons coal.
5	125	18,198	26	36¼
6	268	20,827	30	45¼
7	268	21,693	32	42½
8	248	20,867	30	50½
9	270	21,756	30	54¼
10	250	21,059	30	53
11	198	19,345	25	52
12	273	22,648	30	53
13	282	23,735	30	49½
14	288	23,372	30	45
15	304	23.645	30	45


SCALE $\frac{1}{10}$ = 1 FT.
ARAGO
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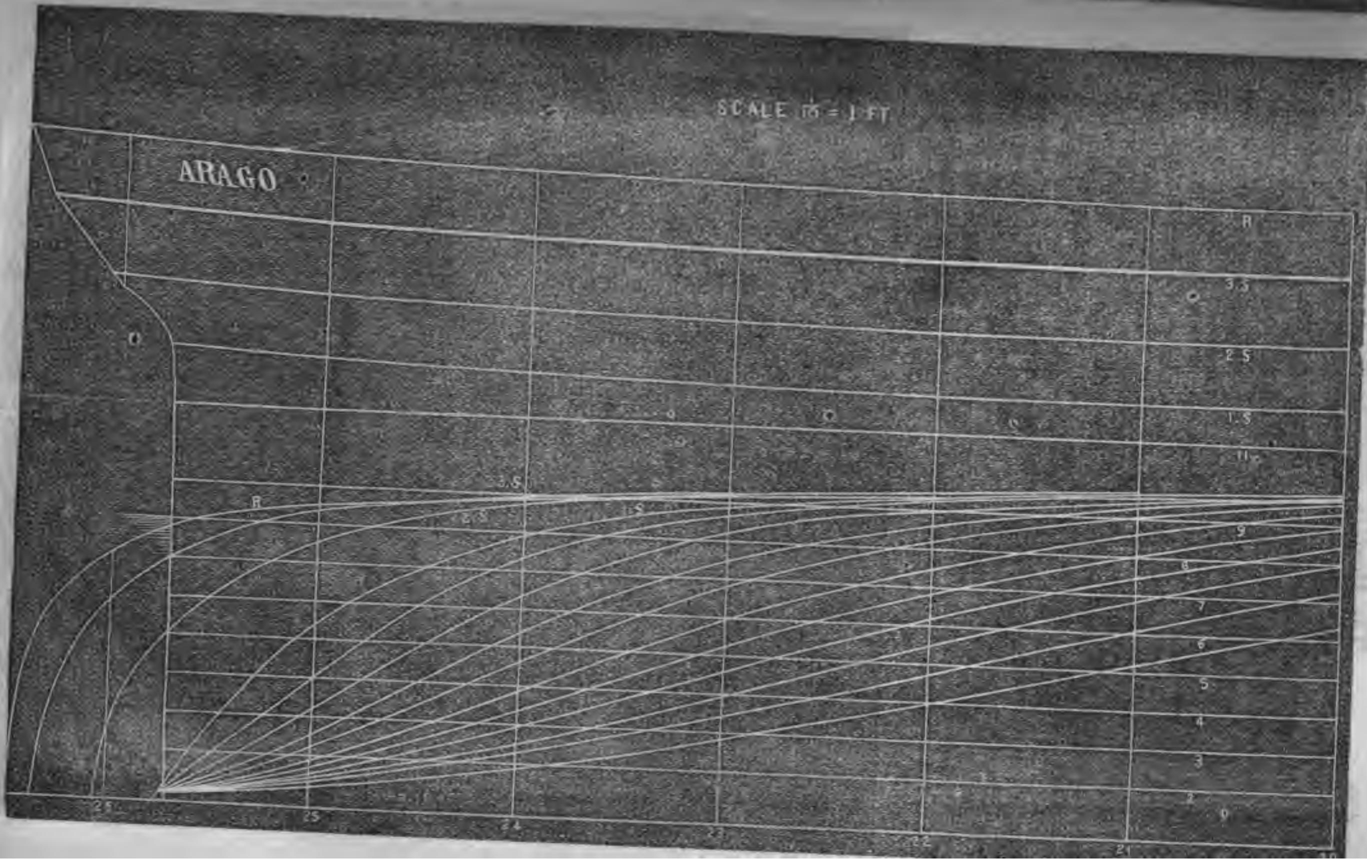
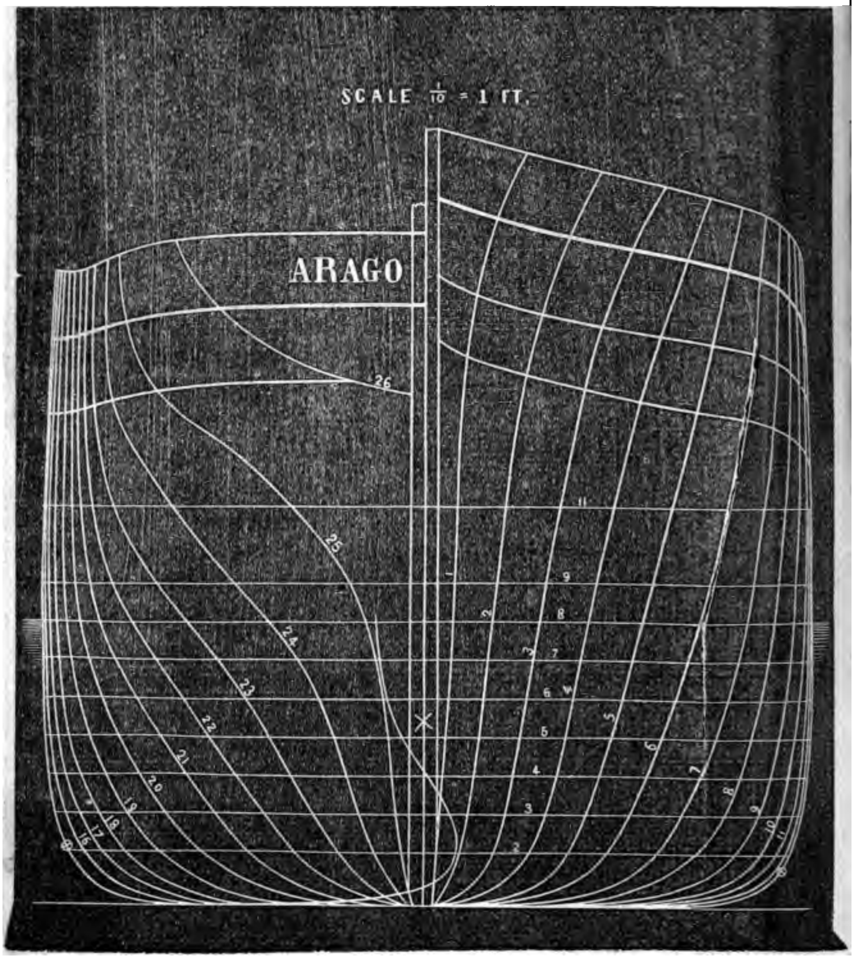


SCALE 1/8 = 1 FT
ARAGO

On the completion of the first voyage, the following address was voted by the passengers, off Sandy-Hook, July 16th, 1855.

Captain D. LINES.—Dear Sir—We take great pleasure in expressing to you, as the unanimous sentiment of the passengers in the steamship Arago, of whom we are a committee, the satisfaction they have felt in their passage from Havre and Southampton, with regard to the excellent qualities of the ship as a sea-boat, the efficiency of the officers, and your vigilance and skill as her commander. Her accommodations for passengers, the cleanliness and good order which are maintained in her internal arrangement, and her steadiness and ease in rough weather, are all that could be desired by families or individuals crossing the Atlantic. We take pleasure in bearing testimony to your uniform and well-known courtesy and kindness, and especially to your unwearied assiduity and effective arrangements in guarding, by every possible precaution in thick weather, against the danger of collision with other vessels. With our best wishes for your health and prosperity, we remain, yours sincerely,

A. W. SCHARET, *Secretary*. J. G. GOODRICH, *Chairman*.



From the London Artizan.

WHAT'S TO BE DONE WITH THE BRITISH FLOATING BATTERIES?

Of the Floating Batteries we scarcely have patience to say another word, they are such an irremediable blunder. Hitherto, we have been unwilling to join in the terms of unqualified disapproval which have been universally launched against them, under the supposition and hope that some of their defects might be brought within the limits of redemption, and that their completion might probably develop some good features which could not be foreseen; but no such thing—though they have been altered, re-altered, and altered again, they exhibit not the slightest symptom of improvement. Their rig has gone through the usual series of transformations, and though apparently conclusively finished at last with a fore-and-aft rig, at the last moment two yards have been added to the fore-mast (their port-sills will soon be at the water's edge; indeed, they do not appear to be more than three feet out of it now, without their armament, iron plates for the upper deck, provisions, or fuel, on board); but the yards are required to enable them to spread more canvass, and give the rudder some command of them. Will it believed, that in the last trial of the *Glatton*, the thing swung round like a washing-tub? Nay, so thoroughly uncontrollable are they, that notwithstanding all the steam and sail-power they could put upon the *Glatton*, it is the general belief that the thing would have drifted on shore, had it not been for the steam-tug in attendance. A case so hopeless, after the expectations we had formed of them, and after the thousands which have been, and will still be, spent upon things so worthless, is too much for flesh and blood to look upon with indifference; it is really beyond the limits of human endurance. Their naval architecture is bad, their rig we consider ought to have been unnecessary—at least, easily removable; and against the blundering and experimenting in the engineering department, we must protest. They were constructed to receive one screw in the usual manner, but were afterwards altered to receive other two; now they are re-altered to the original number of screws, but with another screw of a greater pitch, and engineers cannot fail to perceive that matters must be worse than ever, since it is well known that a bluff-built vessel requires a finer pitched screw than a sharper one, and the result of the last alteration will be an increased expenditure of horse-power for the same speed as at first. But the manner in which the two additional screws were applied calls forth special condemnation, and which we will endeavor to describe. The centres of all three screws were on the same horizontal plane, but the two side screws were in a vertical plane ahead of the central one, and their centres such a distance apart that the discs described by the side screws intersected that described by the centre screw, so that there were two considerable portions deducted from the propelling area of the centre screw.

It is clear that the centre screw, under such circumstances, could do little more than merely turn and splash among the water already put in motion by the screws ahead of it. These batteries ought to have been prepared in the very first case to receive at least two screws; and why the two side screws are now taken away, after going to such an expense, instead of merely unshipping the centre one, we are at a loss to conceive. The latter alteration would have secured at least double their present propelling area, at one tithe the expense.

Here have been some thousands of pounds expended in mere alterations of machinery, and for what?—nought, if we exclude the fact of their final screw being a cast-iron one in preference to gun-metal—ashamed, we presumed, of the expenses already incurred. How long the cast-iron one will last, we leave others to guess. And yet, we could forget all this, if we could see the slightest chance of the things being able to do their work. Their port-sills are so near the water, and will be so close when they are fully armed, manned, and equipped, that they cannot possibly be used excepting in a dead calm. Why was their fighting-deck placed so near the water-line?* Allowing a fair margin for errors of calculation, why was their other deck made so low, that a man 5 feet 10 inches high cannot walk upright without danger of dashing his brains out? Why were they made incapable of being sailed, steamed, and steered, when it was intended to sail, steam, and steer them? We could multiply these queries, but we grow sick in attempting to enumerate the hideous blunders which have been perpetrated over these batteries. The best season, too, for active operations in the Baltic is fast passing away, while the precious time is being humbugged away in the Royal dock-yards in making profitless alterations. In fact, considering that the opinion is very generally entertained that they will never be able to get across the German Ocean—that no one has the slightest confidence in their fitness for the work—that the season in the Baltic will probably be too far advanced to admit of their doing much good by the time they get there, if they can—and, finally, that as they are an object of contempt to all, from Jack upwards—we would humbly suggest whether it is not worth a consideration to break up the present floating batteries, building new ones, using up as much as possible of the old materials, and correcting all previous errors.

The floating batteries are awkward but formidable-looking things, of the following dimensions:—

	feet.	inches.
Length between the perpendiculars	172	6
Breadth extreme	43	8
Depth in hold	14	7
Draught	7	9
Tonnage	1469 tons.	

* Why did they not have more breadth of beam?—[Eds. Naut. Mag.

The decks are of 9-inch oak, resting on 10½-in. by 10½-in. beams, placed 1 ft. 9 in. apart from centre to centre, and supported in the middle by stancheons of iron, hinged at the top, so as to be struck or hung up when in action. The frames, iron plates, and planking of the sides form a solid mass 2 ft. thick; the iron plates outside being 4 in. thick, planed on their edges, placed close together, and bolted to the wood-work with 1¼-in. bolts. The port-holes are 3 ft. 4 in. by 2 ft. 10 in., and look much larger than absolutely necessary, and too inviting for the aim of the enemy to give us that confidence we could wish: nor can we entertain the opinion that their decks are either shot or shell proof; and why such things as these should be completely equipped and rigged, we cannot, for the life of us, divine. The Admiralty is decidedly masting-mad.

The engines of these batteries are of 150 horse-power, non-condensing, and have four tubular boilers, with two furnaces in each; the boilers being of a cylindrical form, with flat ends, and capable of working up to a very high pressure. These batteries have been fitted with a screw, 6 feet in diameter, in the usual place; but other two, one on each side, will now be added to give more propelling power; the shallow draught and small area of the screw, in consequence of the necessarily small diameter, rendering this addition necessary; for, with a pressure of 60 lbs. to the square inch, and the engines making 130 revolutions per minute, the speed attained was but a little over three knots per hour. We have not time this month to pursue the subject as far as we could wish; but we must again protest against masting such things as these batteries, as only offering targets to the enemy, and giving him the licence to do a maximum of mischief in a minimum of time, by bringing it all down about the ears of those on board, and perhaps silencing the battery entirely, or fighting under the peril of setting fire to the wreck; not to mention the greater number of men which such a system of equipment requires; while their steam-power and other assistance which they might have, would surely be sufficient to carry them to the scene of their operations, and then leave them to their steam-power.

We have been amused at the above description, and are reminded very much of the first vessels built by the Government of the United States for the Exploring Expedition, the Pioneer and Consort. These vessels, after being altered and re-altered, were sent on a short cruise, in order to test their fitness for the expedition; and although with a full complement of men, materials, and sea-room, they could not be kept apart, but boarded each other, head on, demolishing the head-rails of the one, and otherwise disfiguring her consort about the protuberances of the anterior part. The seamen attributed this singular freak to a

peculiar propensity the two vessels had for *sliding backward,* or, (in nautical parlance,) for *gathering stern-way,* when lifted by the sea, unless the bow had the preponderance over the summit of the wave. They were finally condemned as unfit for the expedition; and during the blockade of Vera Cruz by the French, one of them was employed by the government as a mail-packet, and was actually fired into by a French man-of-war; notwithstanding the repeated demonstrations furnished of the nationality of her service, the French Commandant could not readily be persuaded that such a heterogeneous mass of materials could by any possible cause come into the possession of the Government of the United States, much less, that she had been built by the government.

How long must the two greatest commercial nations on the globe be subjected to the dictation and direction of Admirals and Commodores in their naval architecture and mechanism?

MOULD-LOFT TABLES OF SCHOONER MAGIC, BUILT AT GRAND-RIVER, MICHIGAN.

Frames.	R'l Heights. feet.	R'l Breadths. feet.	1st W.L. feet.	2d W.L. feet.	3d W.L. feet.	4th W.L. feet.	5th W.L feet.
G	12.77	3.54	.30	.42	.58	.83	1.25
C	12.03	6.17	.82	1.63	2.48	3.30	4.25
Y	11.33	8.15	1.75	3.50	4.98	6.16	7.08
U	10.80	9.66	3.10	5.89	7.62	8.65	9.23
Q	10.30	10.79	5.03	8.33	9.85	10.48	10.73
M	9.88	11.62	7.42	10.46	11.40	11.65	11.66
H	9.62	12.15	9.62	11.77	12.33	12.34	12.24
D	9.42	12.38	10.87	12.41	12.78	12.71	12.51
Dead flat	9.31	12.42	11.27	12.58	12.86	12.77	12.54
4	9.34	12.29	10.95	12.36	12.69	12.63	12.42
8	9.50	11.98	9.98	11.81	12.26	12.36	12.13
12	9.76	11.56	7.98	10.83	11.61	11.79	11.69
16	10.14	11.02	5.08	9.01	10.64	11.08	11.11
20	10.60	10.35	2.60	5.80	8.86	10.08	10.39
24	11.10	9.08	1.04	2.26	4.89	8.25	9.40
28	11.69		.37	.50	.65	1.48	7.53
30		8.—					6.85
32	12.29	7.79					
Cross seam.	7.75						

Knuckle of stern is on 5th W.L., 18 inches abaft of cross-seam; middle of stern is 4.08 feet abaft of aft perpendicular on rail, and rounds forward 7

inches in 8 feet. Stern-post, sided 9 inches at heel, and 14 inches at cross-seam. Frames 18 inches apart, timber sided 4 inches, moulded $8\frac{1}{2}$ at keel and 5 inches at gunwale. Dead-flat frame, located 3 feet abaft of mid-load line. Perpendiculars to load line (3d water line) one foot aft of 28, and one foot forward of G. Water lines 21 inches apart. Stanchions on alternate frames. Dead rise 6 inches, $6\frac{1}{2}$ feet out from middle line. Fore and after ends of keel, and deadwoods, sided 9 inches.

Stem, forward of frame G, on the water lines:—On 1st W.L., 0.70 feet; on 2d W.L., 1 foot; on 3d W.L., 1.08 feet; on 4th W.L., 1.33 feet; on 5th W.L., 1.89 feet; on 6th W.L., 2.92 feet; on 7th W.L., 4.50 feet; on rail, 6.50 feet. The margin line of keel rises $3\frac{1}{2}$ inches on frame C, and one inch on U.

The *Magic* was modelled for a centre-board vessel, the board to be $20\frac{1}{2}$ feet long, between frames 9 and I, which would cross the keel. After the moulds were made, it was thought best to build her with a standing keel, as being stronger and safer. The owners and builder are now satisfied that 20 inches outstanding keel does not furnish the requisite lateral resistance, and her performance by the wind would have been vastly better had the $20\frac{1}{2}$ feet centre-board been placed in her.

Her owners are Wm. M. Ferry & Sons, of Grand Haven, Mich., well known for their industry and enterprise. She was modelled and drafted by Wm. W. Bates, now junior Editor of this magazine, and built in 1852. Her rig is fore-topsail schooner, lightly sparred.

Wm. M. Ferry, Jr., writes that "the *Magic* has never found anything that will sail with her with a free wind;" she has "run away" from reputed clippers of high pretensions in sailing free. "But," he adds, "haul her up by the wind, and she is little more than an ordinary sailer, unless in heavy weather, then she is good"—which amounts to this, she lacks in keel resistance as we said before; and when in heavy weather her great stability enables her to stand up under a large proportionate area of sail, when her performance is seen to improve in comparison with other vessels of less stability. Her centre of buoyancy is also said to be too far aft for a freighting vessel. She drew 14 inches by the head when launched. It is, indeed, desirable that an even trim be preserved in shoal vessels of small size. It is

thought an improvement might be made in filling out the fore-body; but aft, it is conceded, "she cannot be beat in build or *model* by anybody." We would remark, that the posterior end is the one which is most difficult to shape properly, in vessels of great breadth and light draft. There are a few principles in modelling, which practice alone will develop into practical cognizance, be the vessel large or small, deep or shoal draft, and he must be very wise, or dull, indeed, who can find nothing to learn, or to correct in theory, from experience in building after different models. When we shall be called upon to model, or build another vessel of the same kind, we shall try to profit, not only by this example, but all others.

We could now fill out the water lines, and at the same time ease the section lines of the bow, thus obviating the want of buoyancy forward, and still keeping the resistance down, accomplish the suggestions of Mr. Ferry; then, as he says, "give her a large centre-board, (as originally designed,) and she would possess every quality necessary for a lumber vessel for Lake Michigan. She would be the shoalest possible draft, carrying two-thirds of her load on deck, having ample stability, and be a very fast sailer. The *Magic* carries better than you set her at—95 M is her average load. She has had on 110 M. The *Magic* steers and handles like a pilot-boat." She is 95 feet long on the load-line, and 26 feet wide over all at midships, and about 6½ feet deep; yet with these dimensions, and a fine form for sea-going purposes, we find they failed to keep her on her bottom, having *all canvass set* and the watch *fast asleep*, as "watches" sometimes are.

We extract the following account of this "disaster at sea," as many such instances of gross negligence are termed in nautical *parlance*, from a letter written by the writer quoted above:

"The 'Magic' was capsized by gross negligence on the part of the crew. It was the captain's 'watch below'—3 of the clock in the morning. The mate in charge on deck, was paying *profound* attention to his business; crew ditto—all fast asleep; a light breeze blowing, scarcely enough to call it a breeze. The first intimation the captain had, was the noise made by the main-boom swinging across as the squall struck her. She had every

thing set but gafftopsail—all her fore and aft sails, topsail, topgallant, and staysails set. The squall struck her while comparatively motionless; no steerage way, and over she went; no lives lost.

"Another vessel, the 'Dexter,' was capsized at the same time, by the same squall, *with not a rag of canvas set.* Captain John Stuart of the 'Dexter' told me he had three-quarters of an hour's warning of its approach; had ample time to get everything snug; she went over; he had his legs entangled in some downhauls, and had to clear his legs *under water*, when he immediately crawled up to windward; by that time there was not a breath of air stirring. The 'Dexter' was picked up and righted next day. The 'Magic' not until some ten days.

"The particulars of our hunting, or rather cruising after her; when and how we found her; and the et ceteras, in the shape of wear and tear of patience, good nature, &c., &c., would be of no particular interest to you. She is all right now, as good as ever.

"The facts as above I deem your due, for, if I mistake not, you have heard wiseacres say—'Your vessels can't stand up.' The wonder to every sailor and captain that has heard of the disaster, and knew the vessel, is, that her spars were not taken out of her before capsizing.

"Not by any means intimating that you would rejoice at the misfortune of another, I would say, it may be gratifying to you to know, that a vessel, the very opposite of a clipper, a full old-fashioned vessel, was at the same time capsized, and with *no sail set*, so that not a word can be said, that 'had the Magic been anything *but* a clipper, *that squall* could not have capsized her.' It was rather a singular coincidence (that by the way, an extortionately expensive one) the 'Yuba' was the craft that picked her up, and hung on to her until relieved by steamer, and she nearly of the same model—both built by yourself."

There are many things required of a builder not more unreasonable than a guarantee, to preside with watchful providence over the destinies of his fabric, by the carping multitude. Let our friend's "wiseacres" first build vessels of more stability, so as to be able to "stand up" under bare poles, with a "watch" wide awake, and the writer will try again. Until then we rest, confessing our utter inability to furnish *brains*, extra, for the use of those who may control vessels of our construction; yet, had it been within the orbit of our genius to accommodate a few individuals in that line of charity, we have no doubt it would have put money in our pocket. *We* are satisfied, however, with the investments made in more fruitful soil.

IRON KEELSONS,

STRONGER, LIGHTER AND CHEAPER THAN WOOD.

However surprising this announcement may appear to the mind of those most deeply interested in the construction of ships, it is, notwithstanding, a truism. It requires but a glance at the question of longitudinal strength in wooden vessels, to discover that there must be a more mixed construction of iron in order to secure the necessary amount of strength, or that proportion with which every vessel should be furnished.

We think that when ship-owners become fully acquainted with the fact, that the weakest part of their ships may be found along the line of their keel, and that, notwithstanding from 600 to 900 cubic feet of stowage capacity is taken up in the best part of a 200 feet ship, for the centre keelson alone, and still the necessary strength is not obtained, while the weight and cost is alike disproportioned, they will not object to inquire into the practicability of substituting iron for timber keelsons. We have computed the loss of a timber keelson, in the stowage of a vessel having a keelson 180 feet long, 16 inches broad, by 30 inches deep, the contents of which equals 600 cubic feet. Now, the excess of bulk in this keelson over one of the same amount of strength and cost, equals 503 cubic feet, which, reckoned at 40 cubic feet to a ton, gives $12\frac{23}{40}$ tons of stowage, worth $7 per ton for freighting purposes, amounting in a single voyage, across the Atlantic and back, to $176; but again, we have only computed the saving in bulk or stowage capacity, and are equally entitled to add the difference in weight to this gain already shown, and we shall find that 10.3 tons has still to be added. This, computed by displacement or dead weight, equals, at $7 per ton, $144 20; together making for the round voyage, a loss of $320 20. This proportion holds good on any and every keelson in the ship. But however great a saving this may be, it will appear still more manifest, when we attempt to increase the longitudinal strength. It is a settled truth, that if the wooden keelson already referred to, were suspended by the ends, it matters not how well it may be bolted,

scarphed and coaked; it would break asunder at the centre of length, (or in that vicinity,) with its own weight; nor would the case be at all improved if the bulk were increased to double its former height, or 60 instead of 30 inches high. The consequences would be similar. These are the inevitable results of that law in mechanics, which teaches that the strength is only as the mass, while the capacity or bulk is as the cubes; hence, we discover that while we suppose we are increasing the strength by doubling the mass of material, we are thrusting aside the cargo, to make room for this increase of strength, in a much greater ratio than we obtain it. How readily we can discover that we might load a ship's sides with logs of timber, until we shut out one-quarter of her entire cargo; and we would not obtain the unit of strength furnished by the cross-plating, now so generally adopted in large vessels. And can it be that the problem of strength is more difficult when applied at the bottom, than to the sides of ships? Indeed, we might add, that but for the "*weak bilge*," and *weaker bottom*, of ships, there would be no occasion for strapping the sides, which are the only index to the discrepancy of the bottom and bilge. However much, then, we may desire to improve the "strength," and consequent "safety" of vessels, particularly those of the larger class, we should remember that the great "desideratum" in the construction of vessels, is "stowage" "capacity." Hence, the importance of improving the "strength" to sustain the increase, with the smallest amount of bulk, and at the same time, "without an increase of cost."

The following calculation, in connection with the accompanying engraving, will serve to show that iron keelsons are not only the strongest and least bulky, but that they actually cost no more than timber keelsons:—

Computation of comparative strength, weight, bulk and cost of keelsons for ships per foot of length. A keelson of oak timber, 18 inches broad by 36 inches deep, being set down as the unit of strength, weight, bulk and cost.

TIMBER KEELSON.

Cubical contents of timber keelson, 1 foot in length, as above, 4.5 cubic feet.

Required in the log, 4.75 cubic feet, which at 30 cents = ...	\$1 42¼
Labor in working, scarphing and fitting, 4 cts. per cubic ft. = ...	19
9 lbs. of iron fastening, with boring and driving bolts, at 10 cts. =	90
4½ lbs. copper " " " " 36 cts. =	1 62
	\$4 13¼

IRON KEELSON.

Unit of strength, (or same as above,) bulk, .25; weight, .34; cost per foot of length.................................... \$4 10

IRON KEELSON.

Of double strength, bulk .29; weight .50; cost per ft. of length. \$5 90

IRON KEELSON.

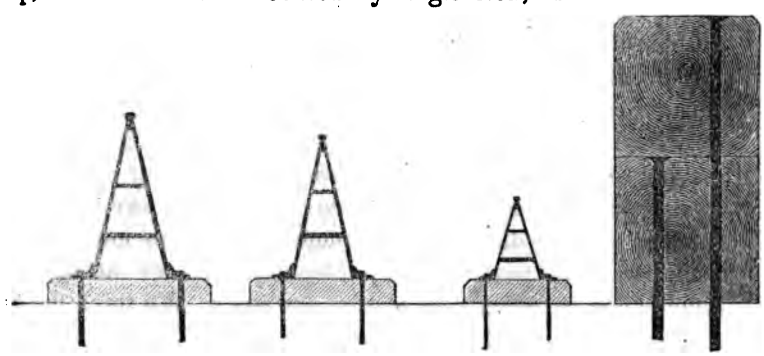
Of 4 times the strength, bulk .35; weight .86; cost per foot of length.. \$8 50

However strange this may appear, that so large a bulk of timber should possess so small an amount of strength, it will appear more manifest when the following conditions are considered:—

First: That we can only reckon upon the strength of a timber keelson at the scarphs; and second, that the flexibility of the material added to the weight, is still another drawback upon its strength. We have no just grounds for computing the strength of more than the one-half of the transverse section of a wooden keelson, because, in the first place, one-third or three parts of its area is cut off in the nibs of the scarph; and in the second place, the scarph itself destroys the strength of other two parts, leaving us but the strength of one-half, while we are compelled to carry the weight and bulk of the whole. Indeed, we often obtain much less than half of the strength by an improper distribution of the scarphs. It is assumed that the loss in strength is only equal to the depth of one of the nibs, and beyond this the keelson is as strong as at any other part. It is plain, we think, that if a squared piece of timber, say 50′ long, 15″ × 16″ be cut its whole length, at such angle as will bring the cut out to a feather edge at one end on the top, and at the other end at the bottom, that the grains are all cut off as completely as though the angle

of the cut were 90°, or at right angles with the line of length, and whatever of strength may be found to remain after the log is thus cut, is the unit of strength, or 1. and that the cross cut at right angles, has no strength, or 0. if again placed together; hence, it must follow the length of the scarph, or the angle between 180°, (less the depth of the log,) and 90° is the measure of strength, other things being equal, or a just proportion being maintained. This is what gives the iron keelson the advantage in cost. We get all the strength we bargain for, while in timber we get but half, at most, and seldom even that amount. In iron, we save in a single year more by the increased room for the stowage and reduction of weight, than the first cost of the iron keelson, in addition to the comfortable reflection that we may have a stronger ship.

The engraving represents the wooden keelson in two depths of logs 18 inches each, and the several sizes of iron keelsons, the smaller furnishing an equal amount of strength with that of the timber keelson, while the middle or next size will furnish double the amount; and that of the larger size, four times the strength of the timber keelson. It will be also seen, that the iron keelsons are raised above the floor timber upon three inch plank. This would not be necessary if the iron were galvanized. They are to be made of plate-iron of various thicknesses, according to the strength desired, and stayed by bolts, as shown in the figures. The small iron keelson is made of $\frac{1}{4}$ inch; the second of $\frac{5}{16}$ths inch; and the large one of $\frac{3}{8}$ths inch, with a T iron in the top, and the bottom secured by angle iron, as shown.



DECK AND SALOON CABINS OF STEAM-BOATS TO SERVE AS LIFE-BOATS.

The *Scientific American* of July 14, furnishes an illustration of a portable cabin placed upon wheels on deck, and secured to the same by turnbuckled iron rods and chains, and prepared for launching if necessary. This moveable cabin has been patented, and we think the inventor claims for it rather more than the plain principles of common sense will warrant. We quote, "and to subserve the purposes of a safety and escape vessel, or life-boat in the event of accident, from foundering or fire;" again, he says, "A ship having this separate cabin, if damaged in the hull, and in a sinking condition, has but to have triggers slipped from the links, and the cabin would float when the hull is sunk under it. Each cabin of this kind is thus a large life-boat." If the vessel herself should be a life-boat, what need of one in the form of an oblong box? and how long would such a box live in an open sea? Echo answers, how long?

How long will the world grasp at the shadow when the substance is within reach? If the passenger vessel herself be a life-boat, as she should be, why leave her for any thing else? And if these "life" cabins and boxes, *in miniature,* be better than a *life-ship,* why not set out on the voyage in them, and build no more ships? Let us not make boy's play in securing safety to travellers on the ocean, but look to the construction of life-ships, and powerful steam-pumping and fire apparatus, in the event of danger to the vessel from flood or fire; and, when this is done, adopt as many other expedients as may appear practical. But will not the wise man of commerce insist upon saving the *ship* as well as her passengers? Why not? when one operation may be made to do both. Will any navigator, having a broad diameter of thought, consent to lose his ship and perish his passengers by adopting what are, at best, but land-lubber expedients for marine dangers? We think not.

ANNUAL FAIRS.

The Twenty-seventh Annual Fair of the American Institute of the City of New-York, is to be held at the Crystal Palace, and will be opened on the 3d day of October, 1855, and continue during the month.

This magnificent and spacious building will afford unusual facilities for the arrangement and display of the various specimens of *Art* and productions of *Nature.* Steam-power will be provided, to put in operation machinery of every description, and the Managers pledge themselves to make every exertion in their power to effect such arrangements, for the accommodation of Exhibitors, as will secure the great ends of the Exhibition.

Premiums of Gold and Silver Medals, Cups, Books, and Diplomas, will be awarded to the Exhibitors of articles deemed worthy of such distinction, by competent judges appointed for that purpose.

The awards will not be confined to specimens prepared expressly for exhibition; but when articles are entered as being of ordinary manufacture for general consumption, full weight will be given to that fact, as showing the actual state of the particular branch to which they belong.

The Managers desire strongly to impress Exhibitors with the necessity of furnishing information, at an early day, of the description of articles they intend to exhibit, and the space required for their proper display.

Rules and Regulations may be obtained by addressing John W. Chambers, Secretary of the Institute.

Eighth Annual Exhibition of the Maryland Institute for the Promotion of the Mechanic Arts. To be opened in Baltimore, October 2d, 1855.

The mechanics of Baltimore, with the co-operation of their generous fellow-citizens, have erected a building on the great thoroughfare of the city, admirably adapted to the purposes of an exhibition of specimens of the industry of the whole country, and they take pleasure in inviting their brother mechanics, manufacturers, inventors, artists and others, of all the States of the Union, to a fair competition in the display of the productions of their respective departments, at the approaching exhibition.

As a further incentive to honorable rivalry in the Arts and Manufactures, the Board of Managers, in addition to the Gold and Silver Medals, Diplomas, &c., hitherto distributed, will award the following:—

One Hundred Dollars for the best specimen in the Machinery Department; to be adjudged by its embodiment of new principles, general utility, or superior workmanship.

Seventy-Five Dollars for the best article, the production of a mechanic or manufacturer, not included in the machine department.

Fifty Dollars for the best specimen of the Fine Arts.

Twenty-Five Dollars for the best production of Ladies' Needle, Knit, or Crochet Work.

They have also added to their awards, a "CERTIFICATE OF MERIT," being the highest regular award of the Institute, and only given to those who at previous Exhibitions have taken the Gold Medal, and who still maintain an unsurpassed excellence in the article exhibited.

Any information in reference to matters of detail, will be promptly given by addressing John S. Selby, Actuary of the Maryland Institute, Baltimore, or John F. Meredith, Superintendent of Exhibition.

BRITISH NAVAL FLOUR MILLS AND BAKERY FOR THE BLACK SEA.

(*Continued from p.* 238.)

WE give the three most important transverse sections of the Crimean Bakery Ships, referred to on page 237. It was our purpose to give a full engraving and explanation of the Crimean Mill and Bakery, with the specifications, in the present volume of the Nautical Magazine, and the following note, written to our correspondent, will best explain the reason why they do not appear.

4 NEW STREET, SPRING GARDEN,
LONDON, 14th June, 1855.

MY DEAR J——

The illustration you expected to get was not procured. The artist who was sent to take sketches, after finishing the bakery, went on board the mill, and an unmannerly Scotchman, who was in charge of the machinery, thought it was some engineer robbing the plans, and turned him out of the ship; this led to a dispute, and he would not return, and I refused to allow one vessel to be given without the other, so the whole was dropped.

P. G. JULYAN.

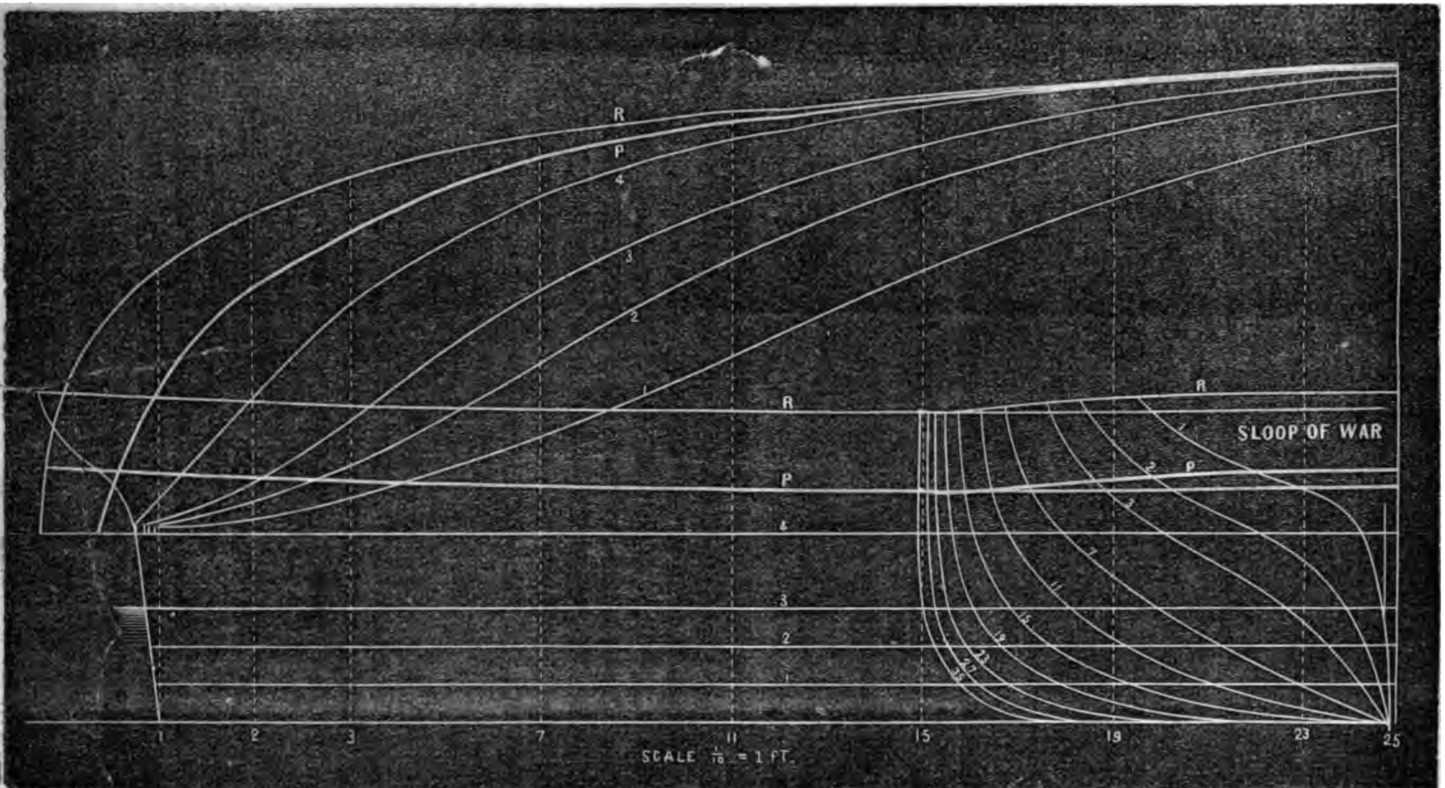
MASKELL'S CORVETTE FOR SHOAL WATERS.

OUR Paris correspondent informs us that the Department of Marine and Naval Architecture has been referred to a Committee of the Association of the Inventors and Artists Industrial of Paris—the report of which will be published in the September number of the *Invention* of Paris. We now give the lines of a sloop-of-war, the calculations and descriptions of which may be found on page 415, designed for 7 feet draught of water, with Maskell's Toggle Joint Keel, an illustration of which may be found on pages 38 and 39, and now on exhibition.

Sectional Plans

of the

FLOATING BA



SLOOP OF WAR
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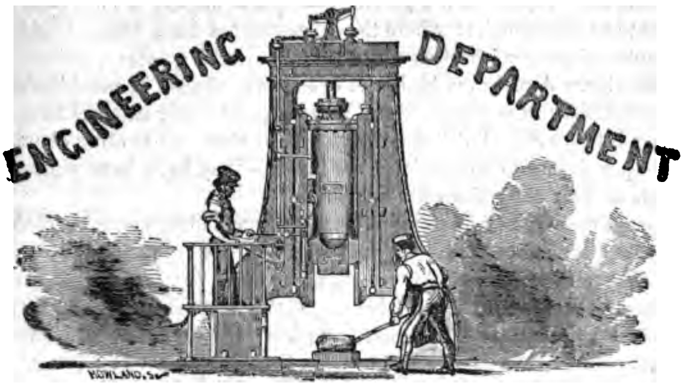
SCALE $\frac{1}{16}$" = 1 FT.



From the Journal of the Franklin Institute.

EWBANK'S IMPROVEMENTS IN PADDLE-WHEEL BLADES.

Marine Propulsion; or the Influence of "Form" in Propelling Blades.

By THOMAS EWBANK, Washington, D. C.

AN increase of speed in ocean steamers is of acknowledged importance to the commercial and social interests of the world. Is it attainable ? Yes; for no truth is more certain, though it may not be perceived, or but dimly perceived, that every acquisition in the arts is a step in the order of progression that serves, or ought to serve, as a fresh starting point to enable us to keep rising in mechanical knowledge and in its applications. How, then, is it to be achieved ? Not by blind experiments, which have been tried long enough. In common with the lower tribes, we can meet exigencies in the arts with instinctive devices, and continue to meet others by the suggestions of experience; but there is a limit to empiricism, and then, in order to advance, an appeal to principles becomes necessary, because new bases of operation are wanted, which are not obvious to sense, and which nothing but an investigation of principles can disclose. To some extent this is, I think, applicable to steamers. There is an element in the propulsion of vessels that has hitherto been overlooked, and upon it, I believe, the next step in advance must be based.

I wish to urge the value of *form* in propelling blades; for I am sure that in it is to be realized the desideratum of speed. A correct outline is every thing in those instruments, because every desirable quality *flows from it**—

* We beg leave to differ with Mr. Ewbank. We regard the model of the vessel as of the first importance, certainly of more consequence than the paddle which propels her.—EDS. NAUT. MAG.

qualities which it is impossible to realize with the old rectangular planks in common use. I question if a grosser example of neglect of form than these present can be named, or where the consequences have been so serious—examples of greater looseness about principles and greater persistence in malpractice. Among the higher or even lower classes of machinery, few such deviations from rectitude can be found, and fewer still that have been so long borne with. But it has happened to them, as to other characters whose proclivities to wrong-doing are innate—they have been endured till a sense of their deformities has vanished.

Though we may bungle along with misshapen blades, we cannot elude the penalties attached to them—as great waste of power, unnatural wear and tear, constant straining of the vessel, no marked increase of speed, and a premature breaking up of the whole. Of this severe punishment for neglect of form the history of steamers is replete; but, unfortunately, offenders are insensible to the offence and to what it costs them. This is not, however, the case in all things; and hence, while steamships still spend much of their costly power for naught; while their wheels continue uselessly to thrash the water and heave up tons over them; while their machinery is jarred and their massive shafting now and then wrenched apart by excessive strainings, the hulls are not kept in such violent and ceaseless paralytic tremblings as formerly. Modern vessels outstrip former ones because their outlines have been improved, and when equal efforts are made to improve those of propelling blades, steamers will begin to be what they ought to be.

Admitting that much is to be done in the construction of vessels and in motive machinery, their rate of going must continue to depend on their propelling apparatus. While it is defective, fleetness is unattainable, though all things else were perfect. The finest formed flyers move heavily with crippled wings, and we can have no swift skimmers of the seas with deformed organs of motion. Believing, as I do, that success is to be found in the true form of propelling blades, the following observations are submitted to marine engineers. Should they conclude that there is nothing in them, nor in the simple proposition itself, I would ask in what direction do *they* expect to succeed? On what other parts of a steamer do they propose to operate? On the hull, the boiler, the engine, or the wheels? On the number, width, depth, and dip of the buckets, &c.? Surely, on these points nothing decidedly new or promising can be expected, much less the development of *new elements* of propulsion; for, after all, that is what is wanted. The squeezing out, by extraordinary exertions, of a few more feet or rods to the hour will not satisfy the present age, let alone future ages. It would only show that the virtue of the present paddle is exhausted; that nothing, or next to nothing, more is to be got out of it.

But are new elements of speed to be elicited from the mere shape or outlines of the blade? Yes. But paddle-blades have long been experimented

on, and the result has led to the universal preference of the original rectangular slabs, and to the recognition of the primitive wheel as "the prince of propelling devices for speed?" True, and the fact is conclusive that the existence of virtue in the *form* of the bucket is not suspected. It is not sought for, and consequently not found. Planks were the readiest forms and materials at hand in the beginning, and were with little reflection adopted, just as they have been continued. It is demonstrable that the highest attainable speed is impossible with paddle-planks, utterly impossible, and that it can only be attained in connection with other engineering desiderata; such as the least waste of power, the least amount of material in the blades, the diffusion of the resistance over their entire surfaces, every section producing equal effects though very unequal in area, the centre of resistance not at the extremity, but in the centre of the blade, and thereby putting the least strain upon the arms or levers. When these properties and the utmost *thinness* in blades, their smooth working, freedom from liability to sudden or increased strains are acquired, the true form will have been obtained, and, what may appear problematical to many, they will be found to have proceeded from it—illustrating a cardinal truth in physics, that in proportion as a device approaches the truth in form, it approaches it in every other particular.

It is, however, a melancholy fact, that there is among our engineers a prevailing indifference to and unbelief in the value of form, which can only be ascribed to their not having looked into the subject. They do not perceive how two blades of equal areas, but differing in their outlines, should possess different properties; surface, not boundaries, being what they rely on.

That there is an innate relationship between cause and effect, and that the latter is modified by the instruments through which the former acts, is obvious to every body. A blunt, that is, a badly formed tool, consumes more power than a sharp one, and gives inferior results; so it is with everything through which force is conveyed. Mechanical science rests upon principles that determine forms and proportions. *There is of necessity a best form for everything and for every purpose.*

What, then, is the form of propelling-blades which communicates properties not found in common ones? In general terms, it is that which is exemplified in Nature's blades. The law that determines them makes them *long, narrow, tapered* and *pointed,* and contracts and expands these features as speed is to be diminished or increased. The form and application are antipodal to rectangular buckets, because the blade must taper as it dips; the deeper it enters the water the narrower it must become.

The effects of this simple change of form are as surprising as they are important. The most essential attributes of a propeller are evolved.

1. *The least amount of material in the blades.* They are not made uniform

in thickness, but are thinned away towards their extremities, a feature incompatible with rectangular blades.

As the reduction of thickness of natural blades outwards is a permanent feature under all circumstances, it might have been inferred from that fact that the same trait might be indispensable to success in artificial propulsion. It has not been so inferred, and we are therefore led at once to inquire why natural blades are reduced outwards and to a mere film? Because length of stroke virtually *diminishes with thickness*, and *a waste of power keeps pace with it*. This is demonstrated in our paddle-wheels. If a pair of these were made in the form of close drums or solid cylinders, they could of course have no propelling power whatever; no more than have grindstones revolving in their troughs. Suppose half of each removed and the usual number of arms and buckets or blades put in their places, the wheels, as they might then be called, could have only half the usual power; and if one-third, one-fifth, or any other proportion of the cylinder were left, in the same proportion would their capacity for propulsion be neutralized. It is, therefore, an inexpugnable truth that whatever may be the number of blades in a wheel, the sum of their thickness must be deducted in every revolution from their sweep through the water, in order to determine their propelling capacity or the work they should perform. In the supposed case of half the wheels being solid, the semi-cylindrical masses were simply distorted blades.

Taking the mean thickness and number of the massive planks that constitute the blades of ocean steamers, they lose from this cause from eight to ten feet of stroke in every turn of each wheel. Assuming two hundred and fifty thousand revolutions as the average number in a trip across the Atlantic, over five hundred miles of stroke are thus lost in each wheel; or, in other words, between twenty and thirty thousand pounds of timber are whirled that distance through air and water, and to no purpose but consuming power and wearing out the motive machinery. We may commit all manner of delinquencies in construction, but we cannot harmonize a philosophical truth with an opposite error. *Thinness* of blades and the *least material* in them, and the consequent least expenditure of power, depend upon form. There is no separating them. Instead of being tapered away toward their extremities as in natural instruments, ordinary blades are made as blunt there as anywhere else. They are, in fact, often made thicker by bolting on additional slats, and, they require this, since the resistance is accumulated there.

2. In the *reduction of the number of blades*. The adoption of tapered ones would enable us to throw overboard two-thirds or three-fourths of the number now used, with the same proportion of shafting, as not simply useless, but positively injurious. This cannot be done with the present blades, on account of the jarring caused by their violently slapping the water as they come down upon it. When few blades are used, the effects of this are

seriously destructive; and hence, to reduce the concussion, the number is increased, on the principle of dividing a few large blows into many little ones. Some boats have had seventy-two blades on each wheel; many have now thirty-six.* Thus one error called in another, for it was not perceived that as their number was multiplied, their efficacy was diminished.

A correct form would have removed the evil at once, and the cause of it. Instead of a propelling surface, extending from twelve to fifteen feet from a vessel's side, being brought in sudden conflict with a wave, a mere point of the blade would have been presented to it. Instead of attempting to arrest the swell, and be shaken or carried away by it, it would go softly and silently into and through it.

3. In *removing the centre of pressure* from near the extremity *to the centre of the blade*, and in an *equable distribution of pressure over its face.* It is the characteristic of a good and durable instrument that its material is so distributed that every part contributes its due proportion of influence towards the intended result, *and no more.*† No other criterion than this is required to determine degrees of worth or worthlessness. How is it with rectangular blades? Why, in truth, it must be admitted that in this respect they are defective, and to a degree which I suspect can hardly be paralleled in modern mechanism. Their lower parts, sweeping through greater spaces in the same time than those above them, do most of the work, nearly all of it, and thus destroy the equilibrium of pressure on the face of a blade, which, *above all things* else, should be secured, and introduce an element of destruction that reaches from them to everything connected with them. One-third of a steamer's blades have been removed from their upper parts without diminishing in the least her speed; a result that might safely be predicted of some boats now running.

An equable distribution or equilibrium of pressure on a surface whose several sections are immersed at unequal depths and moved with unequal velocities, might seem impossible on a first thought; but a second one would suggest that there must be, *per se*, some provision of the kind for this class of movements, as there are for others, and that, too, by varying the outlines of the surface without enlarging it—a principle equivalent to that exemplified in the lever by simply moving the fulcrum; and in fluids to that by which a pint of water may be made to balance a gallon or a thousand gallons; THE principle, in fact, which raises or lowers the centre of pressure on a blade, not by adding anything to it, but by merely widening or narrowing it—*which modifies velocity by surface and surface by velocity*, so that every portion meets only its proper amount of resistance, and all portions harmonize in bringing out one result.

* We think not in one track —EDS. NAUT. MAG.

† The Griffiths Patent Propeller applied to the sides, would most effectually accomplish this.—EDS. NAUT. MAG.

4. Another beautiful result is, that though the blades may taper to a point, a section near that point does just as much work as an equal section through the widest part: extended sweep compensating for diminished surface.

Such are some of the results of form in propelling blades, and they are what are now wanted to enable us to begin a new career in ocean steamers.

Variously shaped blades have been tried on the stern-submerged propeller, but for them no definite form has been developed. Most of them are as wide of the truth as the planks of side-wheels. The resistance is accumulated at their extremities; the largest extent of surface is there, and consequently the greatest strain upon the levers or arms and shafts. The true form, whether worked at the side or stern of a vessel, is only to be determined by the properties named, and, as already remarked, they are applicable to every propeller. The law makes no discrimination in favor of one application over another.

The blades of *oars* partake of the same defect as those of steamers' wheels, though in a less degree, because of their being applied in the direction of their length, instead of being attached across the ends of their levers. Uniform in width, the parts farthest from the centre of motion move with greater velocity than the rest, and hence it is the end of an oar that does most of the work: portions in the rear move slower than it—they're behind it in their action, and cannot therefore sympathize or coalesce with it. In some oars the ends of the blades are wider than the other parts, when the defect is still greater.

If the paddle-wheel were the best mode of propulsion, we should regard Mr. Ewbank's propelling blades as a decided improvement upon the paddle-wheel. But inasmuch as we regard the screw on the side as the best application of propulsory power, we should prefer the application of those principles of equalization of pressure, to the screw itself, similar to the propeller alluded to.

We shall in the next volume give our views more at length in an article on paddle-wheels. While paddle-wheels continue to be used, some attention should be given to the form of blades.

HORSE-POWER IN ENGLAND.

"According to the strict Government rule of admeasurement, the Persia's power is equal to that of 900 horses; according to the plan laid down in Earl Hardwicke's bill, her power is equal to that of 1,200 horses, and according to James Watt's old established rule, (of 30,000 lbs. to the horse,) she is expected to work up to the pith of between 4,000 and 5,000 horses."

What a precious conglomeration is here! and which of the number mentioned is right, and how can the maximum of power be shown?

We cannot do this better than by illustration.

On board the Fall River steamboat Metropolis we find a cylinder of 105 inches, (or of eight feet nine inches) in diameter. The length of stroke 12 feet. The pressure of steam limited to 25 lbs. to the square inch, and to be inside the mark we say 20 lbs., and "cut off" at half stroke, with a vacuum of 28½ inches, and eighteen revolutions per minute of the crank.

Now, if some one of the many intelligent and practical engineers in our city will be kind enough to take up the above, showing the power exerted upon the face of the piston of "Metropolis engine," calculating the power of the horse to be "the raising of 150 pounds, 220 feet per minute;" or "equivalent to raising 33,000 pounds one foot high" [per minute], then we shall have something definite and tangible, of the maximum of the "power of this engine" of the "Metropolis."

We have put the subject in this form to illustrate, that as the engine or cylinder of the "Metropolis" being the same (as the writer is informed) as each of the "Persia's," then, when we have given to us the true power of the "Metropolis" by doubling it, (the "Persia" having two engines), we shall have the true power of the "Persia's" engines, without being befogged—so that one can hardly see, much less to understand, this matter of "900—1,200—4,000—5,000 horses," when applied to, and expressive of the power of some engines. Fulton.

We copy the above remarks from the N. Y. Courier and Enquirer as illustrative of the crude notions entertained of the power of engines, or the manner of computing it. It cannot surely be that the writer is an engineer, or he would not have set down the power of two engines in one vessel, as having *double* the power of a single engine of equal size in another vessel.—Eds. Naut. Mag.

SUCCESS OF THE SIDE SCREW STEAMER BALTIC ON LAKE ERIE.

We have been favored by Captain Whitaker, of Buffalo, with the following communication, descriptive of the satisfactory performance of the side-screw steamer Baltic, an account of which has already been given in the Magazine, in connection with his improvement in using screws instead of paddle-wheels upon the sides of steam-vessels. As a test experiment, the side-wheel steamer Baltic, on Lake Erie, was divested of her engines, boilers, and wheels, in 1854, and is now propelled by a pair of elevated screws on the sides, driven by two short stroke, high pressure engines, with direct application to crank; and notwithstanding imperfections in several important arrangements in boilers, engines, and screws, the alteration has rendered her a very profitable vessel, as may be seen from her services. As a freighting boat, her advantages may at once be apparent. Her boilers and engines are located upon her guards, which leave a free hold, and a clear deck for freight; hence the great loads of cattle she carries are accounted for. Applied under proper circumstances, we would prefer the screws to paddle-wheels.

Buffalo, *August* 21, 1855.

Editors Naut. Mag.:—

I beg leave to ask space for a few words, relative to the success of my improvement in locating screws. The steamer Baltic, now running between Buffalo and Sandusky city, in connection with the New-York Central Rail Road, and Mad River and Lake Erie Rail Road, at Sandusky; the steamer Hendrick Hudson, a boat of about the same size, with a high pressure engine—cylinder, 10 feet stroke, 35½ inches diameter—carrying 80lbs. of steam, applied to paddle-wheels, is also on the same route, making the run from Sandusky to Buffalo in not less than 30 hours, and the run up in 26 hours.

The Baltic's running time down from Sandusky is from 23 to 24 hours, and from 20 to 22 hours going up, by way of Cleveland. You know she has two cylinders of 3 feet stroke, 26 inches bore, carrying 45 lbs. of steam; which I estimate at 70 per cent. less power applied to the screw propellers on the Baltic, than is applied to the paddle-wheels of the Hudson. Yet we find that the Baltic runs much faster, and with one-half of the fuel; and carries two or three hundred tons more cargo, and can carry 350 head of cattle on deck as easily as the Hudson can carry 150.

On Thursday, 9th August, the Baltic left Sandusky for Buffalo, with 295 head of cattle on deck, estimated to weigh about 225 tons, with about 80 tons in her hold; she encountered very heavy weather, with the sea abeam, and proved herself a good sea-boat; with this cargo she could not carry 105 head of cattle on deck, when a paddle-wheel boat, with safety.

The Iowa, a new high pressure paddle-wheel boat, was changed to a stern wheel propeller, in 1853; her propeller is 17 feet diameter, her engine is in proportion to other propellers, with ample boiler to carry 100. lbs of steam, with light firing. Notwithstanding this, she cannot run as fast as the Baltic, by nearly three miles per hour, carrying double the pressure of steam. The Baltic was changed from a paddle-wheel boat to a side propeller, in 1854. If she had the Iowa's boilers, she could carry 100 lbs. of steam, and make 100 revolutions per minute, whereas, she only carries 45lbs., and makes from 55 to 60 revolutions. There is not a stern-wheel propeller on the lakes that can run as fast as the Baltic, by one to two miles per hour, they carrying 65 lbs. steam and the Baltic 45 lbs. The Baltic has made the run from Buffalo to Cleveland in 15 hours and 55 minutes, carrying 45 lbs. steam—distance 180 miles. The running time of stern-wheel propellers is, from 18 to 22 hours, carrying from 60 to 80 lbs.

I shall hereafter apply two engines to right angle cranks upon each screwshaft, in all cases, giving about two feet stroke, with a pitch equal to the diameter of the screw, for freight boats. The Baltic has 13 feet wheel, with 23 feet pitch, which is 8 or 10 feet too much for a freight boat.

The Baltic runs much faster, and carries 300 tons more freight, with two thirds of her cargo on deck, using less than half the fuel she did when a paddle-wheel boat, notwithstanding her boilers, engines, and propellers are imperfect, and can be improved very much. The Baltic left Sandusky for Buffalo, August 17th, with 317 head of fat cattle, and 635 fat hogs, all on deck, weighing in all about 300 tons; having 1,859 bbls. of flour, and about 500 bbls. of other freight in the hold. On the 18th she encountered one of our heavy gales of wind from the southwest, with a heavy sea; notwithstanding her heavy deck load of live stock, she came into Buffalo without meeting with the slightest accident. I doubt whether there is a stern-wheel propeller on the lakes, of equal tonnage, that can carry 100 head of cattle on deck with the same amount of freight in the hold, through as bad weather as the Baltic encountered on her two last trips down, without rolling over and going to the bottom.

Truly yours,

H. Whitaker.

Fractions used of the pitch.	Ratio of the increase of the slips.	Relative slips, supposing the slip with one convolution of the thread to be 30 per centum.
7-7 or 1.000	1.0000	30.000
6-7 or 0.857	1.0024	30.072
5-7 or 0.714	1.0369	31.107
4-7 or 0.571	1.0777	32.331
3-7 or 0.429	1.1492	34.476
2-7 or 0.286	1.2626	37.878
1-7 or 0.143	1.4463	43.389

That within the limits of one convolution of the thread and with the same screw, halving the same surface either by reducing the length one-half or by omitting one-half the number of blades, increases the slip in the same ratio, and this ratio is constant, be the absolute amounts of surface what they may; and that the ratio of this increase of slip for such a reduction of one-half the surface is 1.151, or two thirteenths: for instance, if using *six*-sevenths of one convolution give a slip of 30 per centum, then using *three*-sevenths of the same convolution will give a slip of $(1.151 \times 30 =)$ $34\frac{1}{2}$ per centum; if using *two*-sevenths of one convolution give a slip of 39 per centum, then using *one*-seventh of the same convolution will give a slip $(1.151 \times 39 =)$ 45 per centum, and so on.

3. *With regard to the influence exerted on the slip by employing an oblique generatrix.* That the employment of a straight line for generatrix, having its inner end tangent to an inner cylinder of the same axis as the screw, so that it made angles of 100° and 80°, with a plane passing longitudinally through the axis, exerted no sensible influence on the slip of the screw; and as a curved generatrix is only an oblique generatrix with a constantly varying degree of obliquity, it follows that no sensible influence on the slip would be exerted by a curved generatrix.

4. *With regard to the influence exerted on the slip by employing a curved directrix or expanding pitch.* That the employment of a curved directrix with such a degree of curvature that the tangents at the extremities of the blade made angles of 8° with the chord, decreased the slip of the screw one-sixth; that is to say, if a screw with a straight directrix or uniform pitch gave a slip of 30 per centum, then the same screw, but with a curved directrix whose mean pitch equalled the pitch of the straight directrix, would give a slip of 25 per centum; the curvature of the directrix being as above described and the slip being calculated for the mean pitch.

5. *With regard to the influence exerted on the slip by the division of the same propelling surface into a more or less number of blades.* That the slip of the same area of the same propelling surface remains unaltered, whether that surface be arranged in one blade or many.

6. *With regard to the trepidations of the screw.* That when the propelling surface is arranged in *one* blade, the trepidations are *very strong;* when

From the London Artizan.

ROYAL EUROPEAN YACHTS.

HER MAJESTY'S NEW YACHT "VICTORIA AND ALBERT."

On looking over the "Navy List" the other day, we were very much struck with the fact, that of all the vast naval armament now in course of construction, only *one* paddle-wheel vessel appears in that list, all the others being screws.

As it—the Royal Yacht—may be the last of the *paddle* race in the Royal Navy, we have much pleasure in being able to give our readers the following particulars of this vessel.

The makers of the machinery are the Messrs. John Penn and Son, and from the high standing of this firm as marine engineers, we fully expect that this last example of the *paddle*, constructed for great speed, with all the necessary qualities of compactness and strength combined with lightness,—we say we fully expect that the machinery of this vessel will embody all the experience in marine engineering during the last thirty years, and prove highly creditable to the constructors.

There are four boilers, two placed before and two abaft the engines, with a funnel to each pair of boilers, and the stoke-hold amidships. The following are a few of the principal dimensions of the boilers:

Length of tubes (brass ferruled)	6′ 5″
Diameter of ditto	2¼
Internal diameter of ferrules	2
Number of tubes in the four boilers	3,024

Total fire-grate surface	504 sq. ft.=.84 per H. P.
Total heating surface in flues and tubes	11,050 sq. ft.=23.4 per H. P.
Area through tubes	9,493 sq. in.=15.8 per H. P.
Pressure on the safety-valve	20 lbs. on the square inch.

On carefully looking over the above figures, we cannot but be struck with the very much more common-sense view taken by our engineers now-a-days.

We have often regretted to see, as we have often seen, vessels loaded with *large engines;* and on making the inquiry, "Have you plenty of steam?" "No," was the usual reply; and it is too often so still, that the answer is, "*No, we are short of steam.*" And it cannot be denied that the boiler, as the source of power, is too often lost sight of. This, however, cannot be said of the Royal Yacht.

The following are a few dimensions of the engines:—

Nominal horse-power	600 horses.
Diameter of cylinder (vibrating)	88 inches.
Length of stroke	7 feet.

Shortly after the boat was sent away, a small iron boat of 33 feet in length and 4 feet in width, was made by Messrs. Rennie, with one small disc of 10 inches diameter, for a private gentleman, who made the voyage in her from Folkestone to Boulogne in less than six hours.

In the year 1854, a third boat was built and fitted by Messrs. Rennie for a few gentlemen, for running as a passage-boat on the Cochrane Canal, near Madras. The dimensions of the boat were—

Length..............................	70 feet.
Breadth	7 "
Draught.............................	16 inches.

This boat was fitted with two 13-inch disc-engines and screws, as the Pacha's boat. Her speed, when tried on the Thames, was 10 knots an hour.

NAPOLEON'S STEAM YACHT.

Napoleon's Steam Yacht, side wheel, is 120 feet long, 15 feet wide, and draws about 6 feet water, has a beautiful cabin below, and is provided with seats on the main deck, over which is spread an awning, fore and aft. In securing one of the elements of successful yachting, her constructor has lost sight of the most important one, viz., stability, for, while he obtained a length equal to eight times the breadth, he was compelled to make her sufficiently deep to acquire accommodations for Royalty, and in doing so, drew too heavily on the stability of the vessel; as a consequence, deck passengers are required to move cautiously, not only to maintain their own equilibrium, but that of the vessel.

WROUGHT-IRON ORDNANCE.

Much interest was excited on Monday by the appearance on the open space before the War-office, Whitehall, of a beautiful nine-pounder gun, of polished steel, on its carriage, with limber complete. This gun, which in the course of the day was minutely examined by Lord Panmure, and by many members of both Houses of Parliment, is of malleable or wrought-iron, invented and manufactured by Mr. Dundas, of Dundas Castle, North Britain. Perhaps it would be premature to describe minutely the method of construction of this gun, but the principle is such that

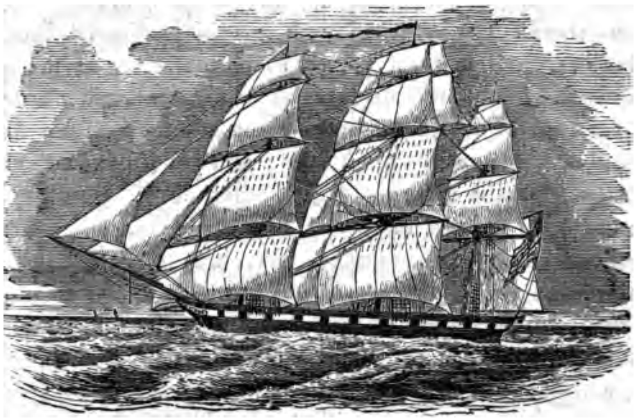
it can be extended to cannon of the largest calibre, and the inventor is confident that he can construct with ease and rapidity guns to throw shot of a ton weight, if desired. Great additional strength is obtained by the reed of the iron being so disposed, as in a twisted gun-barrel, as to resist most effectually the bursting power of the powder. The gun can thus be made much lighter than cast-iron ordnance. Indeed this wrought-iron gun is 10 cwt. lighter than a cast-iron gun of the same calibre. Though heavier than a brass nine-pounder, it is considerably longer, by which a greater range is attained. The great difficulty in making wrought-iron cannon hitherto has been the attempt to make them out of solid masses. It is well known to all mechanics, that nothing is more rare than to obtain heavy forgings perfectly solid, and few very large shafts or cranks can be produced without a flaw, while continued hammering only increases the evil. In Mr. Dundas's gun this obstacle has been overcome, and the perfect strength and trustworthiness of the piece has been proved by 24 service charges having been already fired from it with results entirely satisfactory. As regards cost of production, taking into consideration the greatly diminished weight of metal required as compared with cast-iron, the wrought-iron nine-pounder gun will hardly exceed in cost a cast-iron cannon of similar bore, while brass ordnance will exceed the malleable iron in expense by about four times the cost of production. On the comparative durability of the two materials it is superfluous to say a word. In the course of Monday evening he gun was, by Lord Panmure's order, conveyed to Woolwich under the charge of a party of Artillerymen. At Woolwich, it is understood, the gun will undergo a severe ordeal to test its efficiency.

[Lond. Mech. Mag.

DEATH OF TIMBER INSPECTOR AT NAVY YARD, GOSPORT.

WE learn that the newly appointed timber inspector at Gosport Navy Yard, Mr. Nash Tatem, has been removed by death during the late scourge of fever. Inasmuch as the place is again vacant, we hope the country's interest shall not be made subservient to the political isms of the day, and that the question will not be, is he *hard*, is he *soft*, but is he *competent*; if such councils prevail, James Jarvis, Esq., will be re-appointed. This appointment is of the utmost importance to the Nautical Department of the mechanical world, inasmuch as the experiments which have been so ably conducted by Mr. Jarvis must prove a failure under a change of treatment.

Nautical Department.



SHIPWRECK BY LIGHTNING.

The extent of shipwreck by lightning, either in the naval or merchant service of this country, has never yet been thoroughly investigated. In this respect, though boasting of the superiority of American ships, it must be acknowledged we are far behind Great Britain in the use of means to protect our shipping from the disastrous effects of lightning at sea. The entire British Navy have several years since adopted a thorough and efficient system of Lightning Protectors, on the plan of Sir. W. S. Harris, which is considered the best in that country for the security of vessels from the awful strokes of the thunderbolt, and that has shivered many a lone ship upon the open ocean, and burnt, sunk, and destroyed more property and lives, every year, that might have been saved, than would pay the *first cost* of introducing any good and sure system of protection on board every vessel belonging to the United States.

Like many other improvements and perfective means which have been, and shall continue to be, the province of this Maga-

zine to point out, for the security of navigation, the protection to ships from lightning has not yet elicited that practical attention which its importance demands. The all-sufficient cause of self-interest, did not humanity speak for the drowning mariner and the confiding passenger on the deep, demands, that all vessels should be furnished with properly-adjusted lightning conductors, fixed in their places as permanently as the masts themselves. Since the discoveries of Franklin in electricity have been made, conductors have come into general use for the protection of structures upon land; and yet it has been almost forgotten that the most shocking visitations of lightning have occurred upon the sea, on board the defenceless ship—beyond the reach of help and sympathy. We hear much said concerning the "dangers of the seas," but how seldom do we reflect, that the imperfect work of our own hands does nearly all the mischief of marine casualties. Think of the idea of launching ships, without securing the butts of their plank, or of sparring them without regard to rots, knots, and shakes in their masts and yards, with as much reason as sending them to sea unprotected against the assaults of the electric fluid! For what is the difference in dollars and cents, whether a butt be sprung, and foundering ensues, or the ship take fire, and perish in the flames; or whether a rotten mast goes by the board, and a sound one is rent, and riven into fragments? Yet we are careful to condemn a defective spar, but generally take no care to defend it from the disastrous strokes of lightning. Why demur at a knot? An explosion of electricity may do the work of a thousand knots in the twinkling of an eye.

In England, the subject of shipwreck by lightning has been elaborately treated by Sir W. S. Harris, in several papers to naval and mercantile readers, the most important of which have been re-published by R. B. Forbes, Esq., of Boston, for gratuitous circulation in pamphlet form. With the exception of the efforts of this indefatigable laborer for the salvation of property and life on ship-board, we know of no exertions made in this country to bring this subject prominently before our shipowners and underwriters, and the Navy Department of

the United States. It is true that an old-fashioned system of chain conductors have been used in the Navy, and a few merchant vessels have adopted the most approved conductors, but, in most cases, little attention is given to the matter. As we have said before, the system as adopted in England, and proved reliable, is that of Sir W. S. Harris, for which Mr. Forbes, of Boston, is the agent in the United States. If there are any better methods of applying conductors, that have been invented in this country, we shall be very glad of the opportunity to recommend them to the consideration of our shipowners. In 1848, Mr. Forbes published a pamphlet on the subject of Lightning Conductors, as applied in the British Navy, with the object in view to arouse the attention of the United States Government, and all those directly concerned in the protection of ships from the destructive effects of the electric fluid, to the necessity of fitting them with a permanent and well-tested system of conductors. We regret to add, that his efforts to introduce HARRIS's Conductors into our Navy proved unsuccessful, as most efforts for improvements in that service are prone to, not, however, from any want of appreciation of their value, which was singularly fortunate, but from a mistaken economy on the part of those who controlled the affairs of the Navy. Who can inform us whether the lamented sloop-of-war, *Albany*, did not perish in consequence of this mistaken policy ?—and the same hypothesis may be offered, in regard to the loss of several other national vessels, a list of which we gave in a preceding number of this Magazine.

In 1853, Mr. Forbes again published a larger pamphlet, of 90 pages, being assisted in its publication by the underwriters of Boston, entitled "Shipwreck by Lightning," in the preface of which he remarks, that "should the present work meet with the same fate as the other, I shall at least realize the satisfaction of having tried to do something towards mitigating the dangers incurred by those 'who go down to the sea in ships, and do business on the mighty waters.'" Our commercial men should feel deeply grateful for his public efforts; and in an earnest spirit, not only of wisdom, but of philanthropy, undertake the

introduction of Lightning Conductors on board every vessel in which they may be interested. *The security of property is everywhere the guarantee to the safety and welfare of life.* And the *main* inquiry can always be answered in the affirmative—viz: that it will *pay*, to give *durability* to the result of our labors; else the toil of mankind would indeed be slavish—if we build our houses and our ships of straws for the winds to blow away. Let those who would wish an impression made upon their sensorium, by way of enforcing our remarks, read the following account of the loss of the splendid clipper-ship "Golden Light" by lightning, in 1853, and decide upon the propriety of adding only an insignificant sum of money to the first cost of the "*Golden Light,*" and consequently, averting her fearful destruction by fire at sea.

Capt. WINSOR, says:—"The ship was struck by lightning on the 22nd of February, Lat. 22° 23′ N., Lon. 47° 49′ W., at about 9h. P. M. The fore sky-sail pole was finished off with a copper ball, gilded and secured to the centre of the mast by a copper spindle or bolt, about eighteen inches long, and perhaps half an inch in diameter; the electric fluid struck this ball, and completely shivered the royal-mast; the fore-top-gallant-sail was furled at the time, and from the fact that no marks on the mast or elsewhere were found below the royal-mast, it is supposed that the lightning passed down the *iron* top-gallant-tyes and top-sail-tyes and sheets, into between decks and hold.

"The top-sail sheets, as usual, were single, and were rove through a leader in the thick work just before the main and fore-masts. On each side of the after part of the fore-mast were the chain-lockers, and the ends of the chains were, as usual, suspended to the cover of the chain-locker-hole or pipe; the fore-hatch was near to the forward part of the fore-mast, and on each side of it were stowed a quantity of pails or buckets packed in straw, while the hatchway was filled up with bread, in bags; the ship had in the lower hold a quantity of anthracite coal. The stroke sounded like the discharge of many pistols close to one's head, but no one was aware, until about half an hour after the lightning struck, that the ship was on fire.

At the time of the stroke, the second mate was standing near to the main-rigging, holding on to an iron belaying pin, in the pin-rail, which rail, fore and aft was coppered, to prevent chafes, as is common in many ships; he felt the shock so plainly that he thought his arm was broken, and so stated at the time.

"The fore-hatch was removed as soon as possible, and efforts made to put out the fire, the ship being put before the wind; but it was soon found necessary to close the hatch, and try to smother the fire, while preparations were being made to leave the ship, in case the efforts to put out the fire should fail."

"The ship was filled with gas, and it is supposed that the lightning also ignited the coal at the same time that the cargo in the between-decks was set on fire. Finding the fire beginning to break out near the fore-hatch, it was deemed prudent to leave the ship on the 23rd, at 6h. P. M., in five good boats, well provided with sails and provisions; three of these were picked up on the 28th, at 7h. P. M., by the British ship Shand, of Liverpool, from Calcutta, bound to this port, Captain Christie, and landed here all well, on the 20th March, after being most hospitably entertained. One boat has been heard from at Antigua, and it is supposed the other is safe, as the weather was pleasant." Capt. Winsor also says, "much vivid lightning had been for some time about the horizon, and at the time the ship was struck, it was raining," There were six passengers, including two ladies, and twenty-nine men and boys of the ship's crew, making thirty-five souls in all on board the Golden Light, twenty-three of whom were picked up by the ship Shand.

An historical record of well-authenticated instances in which ships and vessels of the British Navy have been struck and damaged by lightning, under various circumstances, has been compiled by a laborious and careful collection of facts gathered from the official journals of the ships, and published by Sir W. S. Harris, in England, and also re-published by Mr. Forbes, of Boston, in his pamphlet. This record comprises a list of 235 naval vessels damaged by lightning since the year 1793, and does not profess to include every ship which has been so

damaged, but only such cases as have been, by the permission of the lords of the Admiralty, traced, by a long and patient inquiry, in the official journals of the ships. From his investigations, Sir W. S. Harris infers that "it is highly probable that the greater portion of ships engaged in active service since the year 1790, have been at some time struck and damaged by lightning." But the list given is quite conclusive, as to the large amount of damage by lightning in the British Navy, which may be taken as the exponent of fleets and shipping, naval or mercantile, since the vessels of the British Navy visit every sea on the globe. We are, indeed, surprised at the number of casualties due to this cause at sea, which must be about the same in number in a given number of vessels of any flag whatever.

The following Statistical Results have been deduced from an analysis of 235 cases of ships of the British Navy struck by lightning, consisting of 86 ships of the line, 70 frigates, 61 sloops, and 18 other vessels, by Sir W. S. Harris.

"Destruction of Material.—There were damaged or destroyed in these cases 180 lower masts, of which 133 were the lower masts of ships of the line and frigates; 100 of these were ruined as masts. Of topmasts 172 were damaged, and for the most part rendered unserviceable; at least two-thirds of these were topmasts of ships of the line and frigates; nearly all were destroyed. Of top-gallant-masts about 140 were destroyed, nearly all belonging to large ships. In addition to this, we find a very serious amount of rigging and sails, and other spars destroyed or ruined.

Loss of Life.—In about 80, or one-third of these cases, some of the crew were either killed or hurt; nearly 100 seamen were killed, about 250 dangerously hurt, most of whom had, of course, pensions; full 200 more were struck down on the decks—20 to 40 at once.

Fire.—In about 40, or more than one-sixth of the cases, the ships were set on fire in some part of the masts, sails, or rigging, and placed occasionally in great peril.

Services of Ships.—Forty sail of the line, 20 frigates, and

10 sloops, in all 70 ships of the Navy, and averaging one-eighth of the ships in commission at the time, were disabled or placed *hors de combat* by lightning within the short period of five or six years. In 30 at least of the 235 cases, that is, about one-eighth the services of these ships were important; in some instances he cases were very critical.

Estimated Loss to the Government.—The cost of material alone upon these instances, could not have been much less than £150,000; the total loss to the government annually, on account of damage to the Navy by lightning, could not, upon a moderate estimate, have been less than £6,000 in the last twenty-three years of the war, or much less than £2,000 in twenty-three years of subsequent peace."

When it is considered that nearly all the vessels have been obliged to go into port for refit, the real cost, above the mere loss of spars, sails, etc., to the government, is almost incalculable, especially at critical periods. The loss of ships totally destroyed by lightning, adds another fearful sum, too, of life and money, to the aggregate cost, which cannot be estimated.

We shall close this article with "some General Deductions from the forementioned 235 cases, the most important of which we shall quote in a future number; it being of much philosophical and nautical interest to discover, how, and in what way, electricity displays its disruptive powers on shipboard.

"The liability of lightning to strike on any given point, appears to be as follows:—

In 2 out of 3 times it strikes upon the topgallant-mast or next highest point; 1 in 5 times it strikes upon the topmast or next highest point; 1 in 7 times it strikes upon the lower masts, or next highest point; 1 in 50 times it strikes udon the hull directly. From this it may be inferred that the electrical discharge is occasionally determined towards ships in directions more or less oblique to the masts and hull.

The liability of lightning to fall on one or more of the masts simultaneously, is as follows:—In 2 out of 3 instances, a ship is struck by lightning on the mainmast; 1 in 5 times on the foremast; 1 in 20 times on the mizzen-mast; 1 in 200 times on

the jib-boom; 1 in 6 instances, the yards and sails are struck, together with the masts.

A ship may be struck on the fore and mainmasts about the same time, or on the main and mizzen-masts at the same time, or even on all three masts, but in no case on the fore and mizzen-masts simultaneously, independent of the mainmast. In such cases lightning has fallen on the fore and mainmasts together, once in 40 times; on all the masts, once in about 200 times.

The liability of lightning to strike upon a ship in a single or divided stream, and in directions more or less oblique, appears to be as follows:—In 1 out of 16 instances, the electrical discharge falls on a ship in a forked or divided stream of two or three branches. In 1 out of 20 times, it falls obliquely in respect to the masts and hull in a single branch. In about once in 27 times, ships are struck by quickly repeated discharges in the same storm, from 2 to 5 times. We find in these instances, 4 cases in which ships, having a common chain conductor at the main, have been struck by lightning on the foremast, and about 6 instances, in which from some cause the common chain or wire conductor failed to afford the required protection."

With more knowledge and experience upon this subject than any other authority, late in 1852 Sir W. S. Harris presents the following summary of what may, and what may not be fairly expected in securing ships from the dangers of lightning, by a capacious system of electrical conductors. He says, "It is certainly to be expected, that the system should effectually guard against all those violent and regular shocks of lightning falling within the ordinary experience of mankind; and that the system (his system) is adequate to this, is as certain as any very high degree of probability or assurance, depending upon a large deduction of facts, can attain. On the other hand, it is not to be expected that the system could guard against every possible kind of atmospheric electrical discharge, be the circumstances what they may; such, for example, as certain equivocal electrical discharges from the atmosphere associated with solid matter, and sometimes called thunderbolts, fire-balls, etc.; nor is it to be expected that it should effectually guard against those more

palpable atmospheric discharges termed meteorolites, or against sweeping electrical actions mixed up with convulsions of nature, in which case it might be immaterial whether a ship were provided with lightning-conductors or not. Neither is it to be imagined, that this system can quiet all those minor electrical effects dependent on the excited state of the general mass of the air, and the ship under the immediate influence of a thunder-cloud, and which frequently gives rise to luminous phenomena of a perfectly harmless character; nor can it always obviate that tremendous concussion and expansion of the atmosphere, in cases in which a thunder-cloud discharges its lightning in a dense explosion upon the masts, and which, in common with similar mechanical effects produced by the discharge of cannon, will be sometimes severely felt by the sailors, and may rupture or tear asunder, or shake, as it were, in pieces, frangible matter. Against all this no lightning conductor can provide. Our system can only insure protection by disposing of the electrical discharge itself, the great source of destruction, and dispersing or conveying it away under the form of a non-explosive current, and this, in every instance as yet experienced, it has effected.

Taking, then, the common course of nature, as displayed in ordinary cases of ships struck and damaged by lightning, we are quite warranted in concluding, as a general truth, that a vessel armed with a system of protection, such as will render the whole mass, generally, non-resisting or passive, as regards the progress of the electrical discharge, would in no case experience any material inconvenience or damage; and, supposing any slight extraordinary casualty or exception to this general deduction to be within a calculable probability, still we may rest assured, as a positive certainty, that a trifling casualty occurring in any ship having such conductors, would amount to severe damage, and perhaps destruction, without them."

NAVAL.—The U. S. sloop of war Marion, of 16 guns, built at Boston, in 1839, has returned home, from the Coast of Africa, having been condemned as unseaworthy.

INFLUENCE OF THE GULF-STREAM UPON THE TRADE OF CHARLESTON.

(*From Lieut.* Maury's *Wind and Current Charts. Sixth Edition.* 1854.)

Before the gulf-stream was known to practical navigators, the course of trade between England and America was such as to make Charleston, S. C., the half-way house between the mother country and the New-England States, including Pennsylvania and New-York among the latter. At that time, the usual route of vessels bound to America, was to run down on the other side of the Atlantic towards the Cape De Verdes, and until they got the N. E. trades, and with them steer for America. This was the route taken by Columbus; this route brought them upon the coast of the Southern States, where their first landfall was generally made. Then steering to the northward, they drifted along with the gulf-stream until they made the Capes of the Delaware, or other headlands to the north. If now, as it often happened in the winter season, they were driven off the coast by snow-storms and westerly gales, instead of running off into the gulf-stream, as vessels now do, to thaw themselves, they stood back to Charleston or the West Indies, where they would spend the winter, and wait until the spring, before making another attempt to enter the northern ports.

It should be borne in mind that vessels then were not the sea-boats or the sailers they now are. I have in my collection the log-book of a West India trader in 1740. Her average rate of sailing, per log, was about *two miles* the hour.

At that time, the instruments of navigation were rude; chronometers were unknown, and lunars were impracticable; and it was no uncommon thing for vessels in those days, when crossing the Atlantic, to be out of their reckoning 5°, 6°, and even 10°. And when it was announced that a vessel might know, by consulting the water-thermometer, when she crossed the eastern edge of the gulf-stream, and again when she crossed the western edge, navigators likened the discovery to the drawing of blue and red streaks in the water, by which, when the mariner crossed them, he might know his longitude. The merchants

of Providence, R. I., Dr. Franklin being in London, sent a petition to the Lords of the Treasury, asking that the Falmouth packets might run to Providence, instead of to Boston. They maintained that though Boston and Falmouth were between Providence and London, yet that practically the two former were farther apart than the two latter; for it was shown in the memorial, that the average passage of the London traders to Providence, was fourteen days less than the average by the packet line from Falmouth to Boston. Dr. Franklin, on being questioned as to this fact, consulted Captain Folger, an old New-England captain, who had been a whaler, and who informed the Doctor that the London traders to Providence were commanded, for the most part, by New-England fishermen, who knew how to avoid the gulf-stream, while the Falmouth packets were commanded by Englishmen, who knew nothing about it.

These two drew a chart, which was published at the Tower, and the limits of the gulf-stream, as laid down there by that Yankee whaler, have been preserved upon our charts till within a few years. It is yet within the recollection of most navigators, how the traders from the New-England States to the West Indies used to find their way out, "by running down the latitude," as it was called; the practice was to steer south until the latitude of their port was reached, and then to steer due west until they made the land. Their track was, therefore, on the two legs, instead of along the hypotenuse of a triangle. The cause of this practice was in the practical difficulty of finding longitude at sea; for the general use of chronometers, on board ships, is an innovation which the masters of that kind of craft had not learned, twenty years ago, to tolerate. Well might thermometrical navigators, therefore, when the chart appeared from the Tower, giving the longitude of the inner and outer edge of the gulf-stream, liken those two lines to blue and red streaks painted on the ocean to show mariners their longitude. At the time that Dr. Franklin made it known how navigators, simply by dipping a thermometer in the water, might know when they entered, and when they cleared the gulf-stream, Charleston had more commerce than New-York and all the

New-England States put together. This discovery* changed the route across the Atlantic, shortened the passage from *sixty* to *thirty* days coming this way, and, consequently changed the course of trade also. Instead of calling by Charleston as they came from England, vessels, after this, went direct to the port of their destination; instead of running down to Charleston to avoid a New-England snow-storm, they stood off for a few hours until they reached the tepid waters of the gulf-stream, in the genial warmth of which the crew recovered their frosted energies, and as soon as the gale abated, they were ready for another attempt to make their haven. In this way, stations were shifted; the northern ports became the half-way house, and Charleston an outside station.

This revolution in the course of trade commenced about 1795. It worked slowly at first, but in 1816–17, it received a fresh impulse from Jeremiah Thompson, Isaac Wright, and others, who conceived the idea of establishing a line of packets between New-York and Liverpool. This was at a period when the scales of commercial ascendency were vibrating between New-York, Boston, Philadelphia, and other places. The packet-ships of the staid New-York Quaker turned the balance. Though only 300 or 400 tons burthen, and sailing but once a month, they had their regular day of departure, and the merchants of Charleston, Philadelphia, etc., found it convenient to avail themselves of this regular and stated channel, for communicating with their agents in England, ordering goods, etc.

Those packets went on increasing in numbers and size until now, at the present day, we have them measuring 2,000 tons, sailing every day, and running between New-York and every fifth-rate seaport town in the United States, and to many foreign ports.

Thus an impulse was given to the prosperity of New-York; one enterprise begat another, until that city became the great

* Though it was Dr. Franklin and Captain Folger who first turned the gulf-stream to nautical account, the discovery that there was a gulf-stream cannot be said to belong to either of them, for its existence was known to Anghiera, and to Sir Humphrey Gilbert, in the sixteenth century.

commercial emporium, and centre of exchange of the New World. All these results are traceable to the use of the water thermometer at sea. Other causes, doubtless, have operated to take away from Charleston her relative commercial importance —but the primary cause was that discovery which removed Charleston from the wayside of commerce with Europe, and which placed her on the outskirts of the great commercial thoroughfares, and away from the commanding position which she had before occupied. In consequence of the improvements since made in navigation, ship-building, etc., a ship can now go from New-York to England, and back, in less time than when Charleston was the half-way house, she could get to Charleston from London. I therefore submit, whether this fact be not sufficient to turn the scales of commerce; and I claim the result as one that is due to the influence of the gulf-stream upon the course of trade, and the use of the water thermometer by mariners is the key to it all. I have now in process of construction at the National Observatory, a series of charts relating to the thermal state of the ocean, that, when completed, will give us more information with regard to the temperature of that sea, than we now possess with regard to the temperature of any district or shore for one-tenth part of the extent.

I have quoted in the third edition of "THE WIND AND CURRENT CHARTS," but think it unnecessary to repeat it here, "*The first Log-book of the Celia, on the voyage from Jamaica to Bristol, in Great Britain*, 1748." From it the mariner, the merchant, and the statesman, the political economist and the philosopher, may all draw instruction. If this log-book be a fair sample of the log-books of that day, and there is no reason to suppose it otherwise, the wonder is, not that the philosopher, in arranging the different avocations of mankind, should have been doubtful whether to class the mariner at sea with the living or the dead; but that men should have been found rash enough to become mariners at all, or merchants bold enough to make ventures abroad. This voyage was performed without any other means of finding the way across the Atlantic, than such as are afforded by the log and line. It was performed under circumstances

which forcibly remind one of the buccaneers, the sea-robbers, the obstructions to commerce, and dangers to navigation, with which the ocean swarmed in those days. Ships had then to sail in company, and beg convoy for protection. The speed of the fastest in the fleet was regulated by the dullest sailer of them all; and under such a state of things, naval architecture must needs be in a rude state. The enterprising merchant had no inducement to incur the expense of building a fast-sailing ship, because her speed would be practically regulated by the snail's pace of the dullest ship, and the most indolent master in the convoy.

The *Celia*, we may infer from the air of exultation with which, when going *four knots*, the entry is made in the log, "ahead of all the fleet," was at least a fair sailer for her day; and the most that they got out of the *Celia* that voyage, was *five knots*.

The better to appreciate the advantages which we of the present day enjoy, in consequence of so many of the obstructions and trammels which fettered commerce having been stricken off from its various departments, and in consequence of the advances which have been made since that day towards free trade, we have but to suppose a decree ordaining that our ships, sailors, implements, means, circumstances, and conditions of navigation and commerce, should be suddenly reversed, and become such as they were in 1740. The ruin that would follow would not only swamp merchants, but it would sit heavily upon governments and nations.

WESTERN STEAMBOAT STATISTICS.—The number of steamboats totally lost rom January to July, was 39. The estimated damage to boats was $573,700, and to cargoes, $1,229,800. Thirty-one lives were lost. Twelve steamboats were destroyed by fire, seven were damaged by ice, fifty-two were sunk or damaged by snags, five were damaged by explosion, and seven by collision. The whole number of boats on Western and Southwestern rivers is put down at 600. There has been no explosion or collapse of flue of any boiler, manufactured since the passage of the law by Congress, August 30, 1852, and coming under the reduction of steam pressure. In every instance, the disasters have been from boilers made previous to the passage of that law.

THE SEARCH FOR DR. KANE.

The Arctic Expedition for the rescue of Dr. Kane's party, sailed from New-York on the 4th June. Henry Grinnell, Esq., presented the officers of the Expedition with a set of maps, charts, and notes of the Arctic discoveries up to 1854, which he had received by the last steamer from Capt. Inglefield, and John Barrow, Secretary of the British Admiralty. The following is the note from the Secretary of the Admiralty to Mr. Grinnell:

"I almost fear the expedition will have sailed before this reaches you, but I send the enclosed on the chance. One is the chart on which Capt. Inglefield has made some notes, which may be useful; the other is the Arctic papers, which contain the brief summary of his voyage up to Smith's Sound, which I have not previously sent, I think. I wish I knew in what other way I could be of any service to the expedition. Wishing them all the success they deserve, and that they may return with Dr. Kane and his party in the autumn, I remain yours faithfully,

JOHN BARROW."

At the request of Lady Franklin, who was unable to have a suitable tablet prepared in England to send out by this expedition, Mr. Grinnell has caused the following inscription to be engraved on a handsome tablet of white marble, two feet three inches by five feet, which will be erected on Beechy Island.

TO THE MEMORY OF
FRANKLIN, CROZIER, FITZJAMES,
And all their gallant brother officers and faithful
companions, who have suffered and perish-
ed in the cause of science, and the
service of their country.

THIS TABLET
Is erected near the spot where they passed their
first Arctic winter, and whence they issued
forth to conquer difficulties or to die. It
commemorates the grief of their ad-
miring countrymen and friends,
and the anguish subdued by
faith of her who has lost
in the heroic leader of
the expedition, the
Most Devoted and Affectionate of Husbands

And so He bringeth
them into the haven where they would be.

1855.

This stone has been entrusted
to be affixed in its place by the offi-
cers and crew of the American Expedi-
tion, commanded by Lieutenant H. J. Hart-
stein, in search of Dr. Kane and his companions.

The Expedition consists of the ship *Release* and the steam propeller *Arctic.*

Ship Release.—H. J. Hartstein, Lieutenant Commanding the Expedition; William S. Lovell, Acting Master; Joseph P. Fyffe, Passed Midshipman; James Laws, Assistant Surgeon; Charles Lever, Captain's Clerk; V. R. Hall, Boatswain; John Blinn, Boatswain's Mate; William Smith, Boatswain's Mate; Benjamin Moore, Sailmaker; Charles Williams, Carpenter's Mate; William Henry, Cook; John Haley, Andrew Larson, William Carey, David Batay, George Davys, John Smith, William Pinney, Charles Johnson, Thomas Ford, Lewis Lawrence, Francis Taylor, Byron Potter, Thomas Franklin, seamen.

Propeller Arctic.—C. C. Simms, Lieutenant Commanding; Watson Smith, Acting Master; John K. Kane, Assistant Surgeon; Harman Newell, Engineer; William Richardson, Acting Carpenter; Samuel Whiting, Acting Boatswain; Robert Bruce, Boatswain's Mate; John Vandyke, Steward; William Johnson, Assistant Engineer; William Groves, John Thompson, Abraham Kendall, Walter Wilkinson, George Bidwold, James Bottsford, George Price, John Brown, Joseph Brown, Richard Hartley, Geo. Tyler, John Fox, John Gilbert, seamen.

The officers of the Expedition were accompanied down the Bay by Mrs. Hartstein and daughter; Mr. Henry Grinnell; Judge Kane, his sons Robert and Thomas, and his daughter; Mr. Ridley Watts, Mr. Cornelius Grinnell, Capt. Lovell, Mr. Joseph Lovell, Mr. Harman Livingston, Mr. Ephraim Moore, and other friends, who afterwards returned to the city on the Staten Island ferry-boat.

The propeller "Arctic" is of about 250 tons register, was built at Philadelphia, and was originally intended for light ship service, but was purchased for this expedition at a cost of $30,000. The barque "Release" measures 327 tons, and is almost new, having only made two voyages. She cost $27,000. Both vessels have been fitted up with every view to substantial service; both of them have been strongly braced to enable them to sustain a large amount of lateral pressure.

The decks are double planked and caulked, and the inner surfaces of the decks and sides are covered with cork, to prevent the condensations from freezing.

The Expedition is provisioned with rations for two years, which, with the extras, will last a three years' cruise. The food of officers and men is alike, and consists mainly of concentrated meat, soups, patent meat biscuit, self-raising flour, lime-juice, cabbage, preserved potatoes, pickles, whisky, &c. The supplies include about 20,000 pounds of dried meats and soups, and 15,000 pounds of preserved vegetables.

A large quantity of clothing suitable to the Arctic climate will also be taken out, among which are about 500 pairs of woollen stockings. Together,

the vessels take out 300 tons of coal, for the purpose of heating and the use of the propeller, which consumes about five tons daily.

For the navigation of the Northern Sea, many curious implements have been provided—each vessel carries a full complement of ice anchors, of from fifteen to one hundred pounds weight—India-rubber boats, sledges, dogs, and whale-boats—indeed, everything which ingenuity can invent for the success of the enterprising mariners, has been furnished and effected.

The Expedition is well manned and well officered, and there is every reason to hope that it will be successful in discovering and affording relief to the missing party. Two years have elapsed since Dr. Kane, with a crew of sixteen men, set sail from New-York in the little barque "Advance," for the Arctic Seas, in search of Sir John Franklin. His vessel was provisioned for a three years' cruise, which it was supposed might, by fishing and hunting, be made to last one or two years longer. Since July, 1853, Dr. Kane and his party had not been heard from, and it is supposed that during the summer of that year he entered Smith's Sound, and pushed through to discover the supposed open sea beyond, where he imagined Franklin had gone. The following winter was one of extreme severity, and the conclusion is that the "Advance" was so firmly frozen up that the succeeding summer did not release her from the ice. Dr. Kane intended, before entering Smith's Sound, to leave a supply of provisions at Cape Alexander, and it is probable that he has returned to and is at that place.—*Sailor's Magazine.*

GREAT LOSS OF LIFE BY SHIPWRECK.

The loss of the ship Griminesia, Captain Penney, of Calais, has recently been reported to the Editor of the New-Bedford *Mercury*, by Captain Mooers, of barque Maria, belonging to that port. The letter conveying the intelligence bears date March 16th, 1855. The vessel was wrecked on the 3d of July, 1854, on a reef to the westward of New Caledonia, in Lat. 19.45 S., Lon. 161.45 E., not laid down on the charts; she went on at 2 A. M. The only Americans on board were Captain Penney and Mr. Bottom, of Fairhaven, who was killed by the natives on the Island of New Britain. The crew numbered 50 men. There were also on board 650 Coolies from China, all of whom must have perished, with the exception of four seamen, who, with the captain, mate and doctor, left her, in a boat, never seeing her afterwards.

THE PRESERVATION OF LIFE ON OUR COASTS.

The following remarks of the great pioneer of our life-saving efforts in the United States, are worthy of an insertion in these pages, as showing the spirit of the early movers of the enlightened and humane provisions which have since been carried out in the manner indicated by Mr. Forbes. It is always well for humanity, when the wise counsels of its indefatigable friends are realized in the amelioration of human woes. Yet the world often pays less regard to the prayers of the philanthropist, than to the sunshine above its head. When shall the benefactors of mankind become more numerous and influential?

In Great Britain, on the coast of Northern Europe, and elsewhere, on the other side of the Atlantic, much has been done to render perfect the means for saving the lives of shipwrecked mariners.

Life Boats, of various sizes and of various models, made buoyant by air-tight metal boxes, by cork linings, and by long kegs secured under the thwarts, have been, from time to time, adopted. Captain Manby's mortar for throwing a rope to a wreck; Cartes' rocket for the same useful purpose; and Captain Jerningham's grapnel shot, lately introduced, for the purpose of anchoring a line beyond the first breaker on a beach, all tend to lessen the danger attending shipwreck, and ought to command the attention of the humane societies in this country.

A vast amount of good has been done, in England, to suffering humanity, by the adoption of these various projectiles. I am happy to say that large appropriations have been made by Congress, in the Lighthouse Bills of 1847, '48, and '49, for the purpose of providing life-boats, rockets, and other means to save life on our exposed coasts—particularly for the coast of New-Jersey, for which location, ten thousand dollars was appropriated in 1848. The appropriation of 1847, $5,000, was granted the past winter to the Massachusetts Humane Society, and has been expended in furnishing eighteen life-boats to the most exposed parts of the coast within the boundary of the State, and in providing Cartes' rockets to several stations. A bill is now pending in our legislature which, if passed, will enable the Society above named to furnish still further means, and especially to provide life-preservers for the crews of all the life-boats.* I do not permit myself to doubt that the money will be given for this good end; nor do I doubt that Congress will continue to appropriate considerable sums, in order to carry out the

* $2,500 was given by the State.

system on all our exposed coasts. Long Island, alone, requires ten thousand dollars to begin with; and the coast from the Capes of the Delaware to Cape Florida, and so on to the mouth of the Mississippi, must eventually be provided with life-boats, rockets, &c. While the government is spending its millions for the protection of commerce, by keeping up an expensive navy, and for the collection of a revenue, the value of which, in some degree, depends on the means used to save life and property, how little has been done heretofore to protect the lives of our sailors, which are the sinews of that commerce.

I trust that our government will not only continue to give money for life-saving, when exposed on our coasts, but that laws will be enacted which shall render it necessary for passenger ships to be better provided with boats, properly fitted with air tubes of metal, or India-rubber, so that the chances of life, in case of collision, or fire at sea, may be much increased.

The ship Riga, recently destroyed by fire at sea, is a case in point. Although not a passenger ship, she had not the means to sustain her crew, without constructing a raft—the long-boat could not float, and the jolly-boat could not safely carry half the crew in good weather! It is no reproach to this particular ship that she was no better provided. It is a notorious fact, that nineteen out of twenty of our freighting ships have not enough boats sufficiently buoyant to carry their officers and crews in ordinary weather—many of the long boats are used as cow-houses, stock-pens, or, at best, general receptacles for the lumber which has no particular abiding place; they are seldom taken out of the chocks, and generally die a natural death on the ship's deck.

In olden time, a launch was considered an important affair to carry out a bower anchor; but since the days of chain cables, they are no longer useful for that purpose. Let every ship, then, be provided with, at least, one large light life-boat, capable of carrying an ordinary crew; and let every passenger ship have several life-boats, besides India-rubber boats, pontons, floats, or whatever other machine may be deemed expedient for floating a large number of people. It cannot be expected that a packet ship shall have boats enough to carry three or four hundred men, but they should have enough to carry, at least, one quarter of their number, and in addition, India-rubber floats to sustain many more. A single chest, of not very large dimensions, may be made to contain sustaining power, easily available, for a great many souls.

Let the case of the Ocean Monarch, the Poland, the Riga, and a host of others, teach us to guard against such a deplorable loss of life in the first case, and of risk and suffering in others. Every well-appointed ship should carry rockets for throwing lines. Twenty or thirty dollars will supply a ship for many voyages. I pray you, "merchant princes," leave out a little

of the gilding and carving, the rich furniture and the *luxuries* of your floating palaces, and spend a little of your money in the *necessaries of life.* I plead guilty myself, and do not set myself up as an example of perfection in these respects, but I promise to do better in future, and am,

Your very obed't servant,

R. B. F.

THE GLEN COVE REGATTA.

FIRST SUMMER RACE OF THE NEW-YORK YACHT CLUB—NAMES OF YACHTS AND RULES—THE RACE AND THE ATTENDING SCENES—A SUMMER'S DAY ON THE SOUND—THE RESULT OF THE RACE—GLEN COVE—THE YACHT CLUB AND WM. E. BURTON.

The morning of yesterday looked cloudy, and so did the faces of those who were to participate in the Glen Cove Regatta; but by eight o'clock the heavens cleared up, and gave promise of a beautiful day, as it afterwards proved to be.

In due time the boat arrived at the Cove, and the scene there presented was certainly most beautiful. The village is completely hidden by the luxuriant vegetation, and the contrast between the dark green shore and the placid bay, dotted with the white sails and the streaming pennants of over seventy vessels, was most agreeable, and gave an interest to the spectacle it would not otherwise possess.

On the arrival of the Croton at the dock, a number of the lady friends and relatives of the members of the club came on board, also the judges, Wm. E. Burton, Chas. H. Haswell and A. Russell. The following named vessels were lying in the bay, ready to start in the race:—

Name.	Rig.	Tons.	Owners.
Widgeon	Sloop	80	W. D. M. N. & R. W. Edgar.
Haze	Schr.	80	M. H. Grinnell.
Julia	Sloop	70	T. M. Waterbury.
Stella	Sloop	58	Messrs. Stevens.
Una	Sloop	58	R. M. Rutherford.
Twilight	Schr.	56	E. A. Johnson.
Irene	Sloop	48	T. B. Hawkins.
Mystery	Schr	46	Devlin, Stetson & Stagg.
Undine	Sloop	32	H. C. Babcock.
Spray	Schr	77	S. Draper.
Sport	Sloop	38	T. T. Ferris.
Ray	Sloop	30	F. M. Ray.
Norma	Schr	25	A. & W. H. Major.
Lucky	Sloop	17	C. T. Morton.
Mary	Sloop	17	D. C. Kingsland.
Ripple	Sloop	17	A. C. Kingsland.
Ceres	Sloop	16	Chas. P. Ives.
Alpha	Sloop	17	M. Morris.
Early Bird	Sloop	15	T. Greason.
Katydid	Sloop	16	S. W. Thatcher.

The following were the rules of the race, which it will be seen gave the advantage of twenty-five seconds time per ton, for tonnage to the smaller yachts:—

There will be two prizes given by the citizens of Glen-Cove, L. I.

A vessel will be moored abreast of the wharf at Glen-Cove, on the west side of which the yachts will anchor, head to wind, at intervals of 100 yards, commencing with the yachts of least tonnage nearest to the stake-boat.

Yachts may have their mainsails, or fore and mainsails, (according to their rig,) hoisted, and gaff topsails set. The committee reserving the power, however, of ordering all sails to be lowered before starting, or of adopting any mode of starting that they may deem proper, should circumstances render any change necessary.

The course of the race will be around a stake-boat off Throgg's Neck Light, passing it to the northward; thence around a stake-boat off Matinnicock Point, passing it to the northward; thence back to the point of starting, passing to the east of the stake-boat.

In going and returning the course is to be outside of the "Stepping Stones."

The measurement of tonnage to be given in by the owners of the respective yachts intending to compete for these prizes to the Committee of Arrangements, at Glen-Cove, or on or before Thursday evening, the second proximo, at nine o'clock, after which no alteration of any description affecting the displacement of the vessels shall be made.

There are to be no restriction on sails that may be carried by the yachts contending for these prizes.

The yachts will be allowed to carry men for tonnage by Custom-House measurement.

The distance marked out by the courses given is about 25 miles, and yachts will be allowed 25 seconds time per ton for tonnage.

The prizes to be awarded to the two yachts making the shortest runs, and the time in which the race must be accomplished is fixed at nine hours from the time of starting.

The standing regulations of the club are to govern in all cases.

The signals for starting will be two discharges of a gun from the Committee's steamboat—the first, or preparatory discharge being about five minutes before the second or starting, discharge.

If any error should occur in the time of discharges of the gun, a third discharge, occurring within five minutes after the last, will be a signal of recall. The yachts then will start from a line to the west of the committee's steamboat, about half a mile further out of the bay, and their time of passing this line will be noted by the committee.

WM. E. BURTON,
A. D. RUSSELL,
CHAS. H. HASWELL, } *Sailing Com.*

All being in readiness, the signal gun was fired, (this was at 11.15 A. M.) and up went mainsail and topsail, jib and gaff, and off dashed the little fleet under the impulse given by a fine six knot breeze, which was blowing up the bay. The start was pronounced the finest ever witnessed in our waters, so evenly did the vessels glide from their anchorage; the only accident that happened was the Spray loosening a topsail, which checked her course for a time.

At this time the scene from the steamboat which led the race was most animating. The weather was all that could be desired. The green

shore on either side flecked with white sand and brown bluff, forming the cove, up which from sixty to seventy beautifully modelled-vessels, with white sails set and gay pennons streaming, were curvetting and prancing and foaming like spirited horses under the rein of a skillful rider. At first the Ray and Alpha took the lead, followed close by the Haze and Una, while far down the cove were stretched the other vessels at intervals. Before arriving at Sand's Point Light House, the Widgeon, on board of which was Commodore Edgar, began to pull up, and kept passing vessel after vessel until she neared the Una and Ray, which were then ahead. The Julia also, which had lagged behind from the start, boomed out and run nearer shore, and soon her black prow was white with foam. But as the fleet passed the point the breeze began to die away, and fears were expressed that a dead calm would ensue. The smaller vessels, which were far in the rear, now began to pull up, and the little Sport and others run lightly forward, but the Widgeon by this time had passed the Ray and the Haze, and was several lengths ahead of the Una. In this way the race was continued with varying fortune: the Widgeon, however, generally leading until the vessels arrived at the first stake-boat off Throgg's Neck Light House.

As the countrymen had taken great interest in this affair, the Sound fairly swarmed with boats filled with shock headed Long Islanders, and bouncing rosy-cheeked country girls, all of whom manifested their delight by shouting until they were hoarse, and benevolently getting in the way of the yachts with the best intention, no doubt, but with the most unhappy results. And singular crafts some of them were—many of them were modelled after the most antique and unheard of patterns, and contrasted oddly with the elegant and showy yachts that were sporting around them. Throgg's Point was thronged with ladies and gentlemen to witness the yachts swing around the first stake-boat.

The breeze at this time was quite light, and it was not supposed that any expert steering could be displayed while sweeping around the boat. But there was. On came the Widgeon, followed close by the Katydid, when the Norma, which was close behind, by a clever manœuvre, ran in near the boat and rounded the point first, amid loud huzzas. The following is the time as the several yachts passed the stake. The reader will bear in mind that the boats started at 11.15 A. M:—

	H.	Min.	Sec.	
Norma	12	48	6	P.M.
Widgeon	12	48	17	"
Katydid	12	50	40	"
Irene	12	52	3	"
Julia	12	52	33	"
Ray	12	53	38	"
Sport	12	55	16	"
Ripple	1	1	32	"
Haze	1	4	1½	"
Lucky	1	5	40	"
Alpha	1	5	48	"
Mary	1	8	20	"
Undine	1	11	3	"
Ceres	1	17	1	"
Stella	1	17	13	"
Mystery	1	17	33	"

The other boats were so far behind that no notice was taken of them.

After passing the stake the wind, which had died away, freshened again at intervals, and some most eccentric sailing was witnessed. Now one boat shot ahead, then another, the Widgeon, however, still leading them all. Much amusement was created by an old Sound lumber schooner which, catching a favorable breeze, shot ahead of several fancy little yachts, to the astonishment and indignation of their occupants, and to the great delight of the countrymen in boats, who shouted "Go in old lumbers," and cheered the schooner. While the wind lasted, the Mystery caught the same breeze and dashed along in gallant style, until it was thought she would lead the van. Guns were fired and cheers given, but the treacherous breeze shifted and she fell behind. The pilot boat Hornet was also seen in the race and made good ti[illegible]As Matinnicock Point was being made, the Julia began to pull up [illegible]ore it was reached she was ahead. The wind was freshening, and the large boats were doing better, though the little Katydid and Sport were leaping along at a fine pace.

The boats rounded the stake in gallant style, and in the following order:—

	H.	Min.	Sec.	
Julia	3	25	38	P.M.
Katydid	3	28	16	"
Haze	3	28	40	"
Widgeon	3	30	2	"
Una	3	32	3	"
Ray	3	32	18	"
Irene	3	33	54	"
Stella	3	36	17	"
Lucky	3	37	15	"
Sport	3	38	1	"
Mystery	3	38	53	"
Mary	3	39	20	"
Undine	3	40	15	"
Ripple	3	41	55	"
Spray	3	42	40	"
Ceres	3	43	30	"

The Julia after rounding the boat bore immediately for the starting point, while the Widgeon ran in towards the shore, followed by the other yachts, and it is supposed this tack lost the Widgeon the race. The Julia soon distanced her competitors, and it was supposed on all sides she had won the race. As the boats were nearing the last stake great excitement was manifested by those on board the steamboat, and the fate of the several boats canvassed with great earnestness, it being known that the prize would not be for the swiftest but for the most rapid in proportion to tonnage. Away sped the yachts foaming at the bows and leaving a white line on the Sound in their track. The Sport, whose chance for the race was excellent, run against a sloop and was disabled, to the grief of her well-wishers, of whom there was a good many on the Croton.

The last point was reached in the following time—the distance run being twenty-five miles:—

	H.	Min.	Sec.	
Julia	4	15	32	P.M.
Widgeon	4	22	05	"
Una	4	25	57	"
Haze	4	27	00	"
Katydid	4	27	25	"

	H.	Min.	Sec.	
Irene	4	29	50	P. M.
Stella	4	22	47	"
Ray	4	33	30	"
Mary	4	37	46	"
Undine	4	39	15	"
Lucky	4	40	47	"
Ripple	4	44	45	"
Mystery	4	48	10	"
Ceres	4	54	05	"

The Julia ran the distance—twenty-five miles— in five hours and thirty-two seconds. After considerable figuring it was at length discovered that in accordance with the rules, the Katydid was entitled to the first prize, and the Lucky was fortunate enough to secure the second. The race was an exceedingly close one, and was said to be the most interesting one, on that account, ever beheld.

The first prize was a fine silver vase, curiously chased, and surmounted by a handsome representation of a yacht in full sail. Valued at $150.

The second prize was a goblet borne by a sea nymph, the cup of which represented the cornucopia or horn of plenty, and the base was formed of sea-shells and corals, ingeniously worked. Cost $100.

To Mr. William E. Burton the people of Glen-Cove are indebted for this race. It was he who induced the club to race at that place, and to his liberality the affair owes its success. The inhabitants of Glen-Cove and he were in a kind of partnership; they took the credit of the affair, and he paid the money.

The Katydid and the Lucky were both built by Messrs. Fish and Burton of this city. George Steers' boats were fully equal to their reputation. Thus ended the first summer regatta of the New-York Yacht Club. May we soon see its like again—*N. Y. Herald.*

NOTICES TO MARINERS.

Quarantine Regulations.—At a special meeting of the Commissioner of Navigation and Pilotage, it was

Resolved, That in consequence of information received of the existence of yellow fever in Norfolk and Portsmouth, Va., it is ordered that all vessels arriving from those places, as also all vessels arriving from ports south of Cape Fear, where the yellow fever exists, shall not be allowed to proceed to town under thirty days from the date of their clearance or departure from such ports or places. The said order to continue in full force and effect until the 1st day of November next.

By order of the Board.

Wilmington, N. C., Aug. 4, 1855.

We are authorized to state, (says the Charleston *Courier*, of the 4th Aug.,) that all vessels from ports north of Norfolk, Va., will be, in accordance with the Quarantine Ordinance, subject to quarantine at this port.

Barnegat Lighthouse.—The Light at this place has been improved by substituting for the old Reflector apparatus a Fourth Order Fresnel Lens, which illuminates the entire sea horizon, and the approaches to Barnegat Inlet.

Philadelphia, July 30, 1855.

CHANGE OF LIGHT AT ASHTABULA, LAKE ERIE, OHIO.—The present fixed Light at Ashtabula, on Lake Erie, Ohio, will be discontinued on or about the 1st of August next; and thereafter a fixed Light varied by flashes, will be exhibited from sunset to sunrise, as usual.

The interval of time between the flashes will be two and a half (2½) minutes.

By order of the Lighthouse Board.

BUFFALO, N. Y., July 18, 1855.

NEW SOUTH SHOAL LIGHT BOAT.—A new and substantial Light Boat for the South Shoal is being built at Portsmouth, N. H., Navy Yard.

The vessel will be 250 tons burthen, and will take her station about the middle of September. We learn that the French Lens is to be substituted in the place of the ordinary reflectors at present in use in our Lighthouses in this district. The Lighthouse upon Palmer's Island is to be furnished with the French Lens during the coming Fall.

A new Lighthouse is being constructed at Gay Head. It is to contain a revolving light, and is intended to be completed and ready for use during the month of November.—*New Bedford Mercury, Aug.* 11.

The Charleston *Courier*, of the 9th August, says:—We are requested to state that the middle Buoy of Beach Channel has been replaced.

The following, from Capt. Marquand, of the Br. schr. Mentor, is published in the London *Shipping and Mercantile Gazette*:—

June 29.—On my passage from Laguna to Terminos, at 4.50 P.M., saw a rock off the larboard beam, appearing about three feet above water, bearing E. N. E., distance about one mile; having had good sights for chronometers in the morning, and a good meridian altitude, the distance run from noon to the time of sighting the rock places it in lat. 40° 27′ N., lon. 49° 56′ W. I take the rock to be the Hervezaults seen by Capt. Maxwell, of the ship Home, of New-York, on the 12th of May, 1827; also by Capt. Lourp, of the brig Alexander Savage, in the year 1816.

Position of the rock by Capt. Maxwell, lat. 41° 02′ N., lon. 49° 23′ W.

Position of the rock by Capt. Lourp, lat. 41° 06′ 23″ N., lon. 49° 57′ W.

Position of the rock by Capt. Marquand, lat. 40° 27′ N., lon. 49° 56′ W.

Capt. Lourp's and Capt. Maxwell's taken by dead reckoning.

A bell to be rung in foggy weather, weighing 1,300 pounds, worked by machinery, has this day been erected on the Eastern point of Old Point Comfort, near the Lighthouse.

It is elevated on a frame work about 30 feet above sea level, and will strike seven times per minute, at intervals of eight and a half seconds.

It can be heard at a distance of from one to six miles, according to the direction of the wind.

By order of the Lighthouse Board.

NORFOLK, July 20, 1855.

A bell, to be rung in foggy weather, weighing 1,300 pounds, worked by machinery, has this day been erected on Cape Henry, entrance to Chesapeake Bay, Va.

It is elevated on a frame work about 40 feet above sea level, near the pitch of the Cape.

It will strike seven times per minute, at intervals of eight and a half seconds, and can be heard at a distance of from one to six miles, according to the direction of the wind.

By order of the Lighthouse Board.

NORFOLK, July 13, 1855.

LIGHTHOUSE INSPECTOR'S OFFICE,
Charleston, July 24, 1855.

After the 30th July, the St. Helena Bar Light Vessel will be removed for repairs. No light will be shown at that place until further notice. A black Cask Buoy with L V marked in white paint, will show her station.

By order of the Lighthouse Board.

Notice is hereby given, that in conformity with previous advertisement, the fixed Light hitherto shown from Henrick's Head Lighthouse, Maine, has been discontinued, and that there will hereafter be shown from the Lighthouse, a revolving light.

The lighting apparatus consists of three fountain lamps with 21 inch reflectors, and the interval between the flashes is one minute.

By order of the Lighthouse Board.

PORTLAND, July 27, 1855.

COWES, July 5.—Capt. Lindstrom, of the Swedish schr. Terpsichore, arrived here to-day from Rio Janeiro, reports that on the 25th June, at 6 P. M., in lat. 45° 33′ N., lon. 22° 20′ W., by chronometer, he passed a rock about 1½ cables' length from the ship, and about 1½ ship's length from E. N. E. to W. S. W., and that he and the officers could clearly see with a spy-glass between the seas three pointed rocks out of the water, which they supposed in fine weather might be two or three feet under water. Their attention was first drawn to the above by seeing a very large whale jumping high out of the water and remaining on the same spot, and there was also a great quantity of sea-birds around the place. The schooner was going about 8 knots at the time, with the wind at S. S. W., and high sea, which prevented them from inspecting the rock with a boat. On the 21st June, the Terpsichore was off Flores, and on the 2d July, by the Lizard, and on both occasions found the chronometers perfectly correct; the latitude might be three or four minutes to north, from the tides running in a N. N. W. direction.

BUOYS ON STELLWAGEN'S BANK—ENTRANCE TO MASSACHUSETTS BAY.—The following Buoys have been placed on Stellwagen's Bank, at the entrance to Massachusetts Bay, to mark the approaches to Boston harbor, viz:—A first class Buoy, painted red, in about 11 fathoms water. N. W. by N. ½ N. (true) 6 miles from Race Point Lighthouse, and E. S. E. (true) 28½ miles from Boston Lighthouse.

A second class Nun Buoy, painted with white and black perpendicular stripes, in about 15 fathoms water. E. ½ S. (true) 26½ miles from Boston Lighthouse.

A first class can Buoy, painted black, in about 15 fathoms water. E. by N. (true) 21¾ miles from Boston Lighthouse.

By order of the Lighthouse Board.

BOSTON, Mass., July 10, 1855.

FIXED LIGHT AT MARSEILLES.—The French Government has given notice, that on and after the 15th of August next, a Fixed Red Light will be exhibited on the tower recently erected on the Southern head of the Mole of the Port de la Joliette, at Marseilles.

The Light stands at an elevation of 81 feet above the level of the sea, and will be visible at a distance of eight miles in clear weather.

The tower is in lat. 43° 17′ 56″ North, lon. 5° 21′ 26″ West of Greenwich.

ADMIRALTY, London, July 27, 1855.

Buoys—Newburyport Harbor, Mass.—A Nun Buoy, of the third class, painted black and white perpendicular stripes, has been placed in five fathoms water, at low tide, off Newburyport Bar, the west light bearing W. by S., distant 2,267 yards. Vessels bound in over the Bar, should bring this Buoy in range with the west light, and run for it. This course will carry them over in seven feet at low water.

The eastern light has been extinguished, and in its stead a small Bug light has been lighted. In running in at night, the bug light and the western light must be brought in range.

When over the Bar, and half way to the shore, there will be found a spar Buoy, painted black, to be left on the port hand. Then the course is N. W. ¾ W., up past a Buoy in mid-channel, painted black and white perpendicular stripes, to the red Buoy on Black Rocks, when it is W. ¾ S.; passing a Buoy off Joppa Flats, painted black, (to be left on the port hand,) and a red Buoy on Joe Noyes' Point, (to be left on the starboard hand,) to the upper mid-channel Buoy, painted black and white perpendicular stripes; thence between the two piers up to the anchorage. These piers are near the city.

By order of the Lighthouse Board.

Boston, August 14, 1855.

Bell Boat near Harding's Ledge.—On or about the first of September next, the Nun Buoy, now on Harding's Ledge, off the entrance to Boston Harbor, will be removed, and an iron Bell Boat, painted black, with the words "Harding's Ledge," in white letters, on both sides, will be placed in its stead. The bell will be sounded by the action of the sea.

Disasters of 1854.—Mr. E. Meriam states, in the N. Y. papers, that one of his assistants has been for seven months engaged constantly in compiling the accounts of shipwreck and loss of life and property on the ocean in the year 1854. His manuscript pages already number 1,245, exclusive of a large volume covered by the index. The number of vessels which have been lost or injured are 5,382, exclusive of steamers and boats on the lakes and rivers yet to be added, and which will swell the aggregate to about 6,000. The loss of life exceds 9,000, and the loss of property may be estimated at the round sum of $40,000,000.

LAUNCHES.

At Wiscasset, July 28th, by Harriman & Co., a barque of 450 tons, not named.

At Machias, July 28th, by N. S. Longfellow, brig Nathan, 240 tons.

At Machias, July 11th, by Gardner & Longfellow, schooner Mary Alice, 180 tons, owned by her builders, modeled by Mr. John Shaw.

At Cherryfield, by Amos Dyer, brig Randolph (herm.) 348 tons.

At New-York, late in July, by W. H. Webb, barque Texas, 500 tons, for Wakeman, Dimon & Co.

At New-York, Aug. 16th, brig Sabine, 350 tons, by above builder, 112 feet long, 28 feet wide, 12½ feet deep.

At Providence, Aug. 18th, by McLeod & Salisbury, schooner Thomas J. Hill, 200 tons.

At Buffalo, N. Y., July 26th, by B. B. Jones, schooner Golden Harvest, 370 tons.

At Bath, July 31st, by Hall, Snow & Co., ship Caravan, 1300 tons, 197 feet long, 38 feet 10 inches wide, 24 feet deep.

At Harpswell, Aug. 10th, by Capt. Norton Stoner, schooner Grandilla, 220 tons.

At Prescott, Me., recently, ship Mary E. Balch, 1300 tons.

At Pettiquamscut River, South Kingstown, R. I., Aug. 3d, schooner Justice, 100 tons.

At Medford, Aug. 4th, bark Young Greek, 400 tons.

At Fairhaven, July 28th, ship Seconet, 400 tons, by Delano & Co.

At Fairhaven, July 29th, a ship, 480 tons, not named, for a whaler, by Reuben Fish.

At E. Boston, July 28th, by Donald McKay, ship Defender, 1400 tons.

At Chelsea, July 28th, ship Wilbur Fisk, 1000 tons.

At Bristol, R. I., Aug. 15th, schooner F. H. Payton, 200 tons.

At E. Boston, Aug. 11th, by Hugh R. McKay, ship Ganges, 1200 tons.

At Mystic, Aug. 6th, by C. Mallory, a barque of 700 tons, owned by her builder.

At Portsmouth, N. H., by Fernald & Pettigrew, ship Noon Day, 1000 tons.

At Cape Elizabeth, by J. W. Dyer, tug boat Uncle Sam. Engine of 80 horse power.

At Cleveland, Ohio, by Peck & Masters, schooner David Tod.

At Port Jefferson, July 5th, schooner Reindeer, 200 tons.

At Port Jefferson, July 7th, by John E. Darling & Co., schooner Transit, 250 tons.

At Patchogue, L. I., schooner John E. Stanley, 275 tons.

At New-York, Aug. 22d, by the Westervelt Ship Building Co., barque Zephyr.

At Cleveland, Ohio, by Johnson & Tisdale, steamboat James Carson.

At Bath, Aug. 15th, from the yard of Larrabee & Moses, ship Lawson, 597 tons.

At Greenpoint, by Edward F. Williams, barque Clara Haxall, 475 tons, 125 ft. length. 30 ft. breadth, 12 ft. depth.

At Newcastle, Del., Aug. 1st, schr. George Davis, 335 tons, by George Deskyne.

At Baltimore, July 18th, ship Macaulay, 176 ft. long, 37½ ft. beam, 23 ft. hold.

At Essex, Conn., July 17th, schr. Amy Chase, 200 tons.

At Searsport, Aug. 18th, from the yard of Wm. McGillivray, a fine copper fastened brig, B. K. Eaton, 225 tons.

LUMBER TRADE OF CLEVELAND.—The Cleveland *Herald*, of August 10th, says:—"The aggregate amount of pine lumber received here the past season is about 48,000,000 feet, being some 12,000,000 feet less than the year previous. This falling off in the receipts is mainly attributable to the anticipated benefits of the Reciprocity Treaty, which did not go into effect until late last fall, and to the great pressure in the money market, causing a temporary suspension of improvements. This stringency in money matters has mostly passed by, and all manner of building materials are again in good demand, and from present appearances there is a 'good time coming' for the lumber dealers of Cleveland. The prices of pine lumber are rapidly advancing, being from one to three dollars per thousand higher than in the spring. The effect of the Reciprocity Treaty has not, as many supposed, reduced the price on lumber, but has resulted in raising the price on timber and timbered lands in Canada, in the same proportion as the tariff reduced the price of lumber.

DISASTERS AT SEA.

STEAMERS.

America, was totally destroyed by fire, June 24, at anchor in Crescent City harbor.
Kentucky Home, (steamboat,) was in contact with the steamboat Telegraph, No. 3, July 3, on the Ohio River, and sank.
Louisiana, ran ashore, and was scuttled at the entrance to Green Bay, (Mich.)

SHIPS.

Panama, at San Francisco from New-York, sprang foretopmast, lost sails, &c.
May Queen, New-Orleans for New-York, put into Key West, leaking.
Water Witch, at Ylapa, (Mex.,) is reported lost on West coast of Mexico, is 1204 tons.
The Ports of San Blas and Mazatlan, were visited, about June 1, with heavy gales, and some 6 ships are reported lost, no names, about 80 lives lost at Mazatlan.
Montreal, New-York for La Rochelle, got ashore near the latter port.
Rockall, at Calcutta from Boston, slightly damaged, May 22, in a hurricane.
Isaiah Crowell, Calcutta for Boston, lost false-keel, &c., and otherwise damaged, returned to port.
Gazelle, Boston for Jacksonville, put into Wilmington, N. C., and lost some spars and sails.
Adams, at Boston from New-Orleans, July 31, struck on the Rose and Crown shoal, near Nantucket.
Emerald Isle, for New-York, was in collision, July 24, with ship Red Jacket, near Liverpool.
Volga, at Boston from Pilian, lost spars and sails, on 23d July.
Unknown, was passed about 30 miles from San Francisco harbor, high and dry.
Fanny S. Perley, at Philadelphia from Liverpool, lost spars and some sails, July 29.
Saguna, Gonaives for New-York, put into Nassau, Aug. 16, in distress.
Echo, put into Dover, July 29, had been in collision with unknown ship, lost maintopmast.
James T. Ford, Honduras for Queenstown, put into Baltimore, Aug. 15, leaking.
Polynesia, at San Francisco from Boston, lost one man, some spars, sails, &c.
Ottawa, Quebec for Liverpool, was wrecked in the Straits of Bellisle.
Chatsworth, lost foremast, Aug. 10, in a gale.

BARQUES.

Isabella, (whaler,) lost one boat, part of bulwarks and rail, April 12.
Almidia, Apalachicola for New-York, was struck by lightning, July 21, and damaged in spars.
Ceres, Genoa for Sumatra, put into Mauritius, leaking badly.
Hecla, New-York, a total loss in White Oak River, about Aug. 1.
Unknown, (French,) St. Domingo for France, totally lost at Atwood's Key, Bahamas, on 14th of July.
Unknown, (Eastern vessel,) drifted into Aklins, dismasted and abandoned.
Mary Hannah, Mobile for Hamburg, was wrecked July 15.
Velocity, at Santa Martha from New-York, totally destroyed by fire, July 11.
Jenny Pitts, Trinidad for Falmouth, Eng., put into Rockland, Aug. 4, in distress.
Scott Dyer, Buenos Ayres for England, sprang aleak, and put back to Montevideo.
Mary Morris, at New-York from Greenock, July 16, encountered an iceberg, and was much damaged.
Cossack, at Boston from Padang, sprung bowsprit badly, May 18.
St. Andrew, New-York for Montevideo, put into Halifax, Aug. 12, leaking badly.
Caroline, at Charleston from New-York, lost sails, July 30.
A. A. Eldridge, San Francisco for Puget's Sound, lost foremast.
L. M. Hubby, was lost on Lake Michigan, 11 lives lost, Aug. 12.

BRIGS.

A. H. Wass, Georgetown, S. C. for New-York, was entirely consumed off Cape Fear Bar.
Governor, (Br.,) Savanilla for Liverpool, was in collision, and lost bowsprit, some other spars, &c.
Marcellus, New-York for Port-au-Prince, wrecked, July 3, on N. E. point, of Inagua Island.
Black Swan, was lost, July 26, on the bar at Georgetown, S. C.
Jas. Caskill, St. John's, N. B., for Crimsby, ashore, July 13, on the Goodwin Sands, Trinity Bay.
Unknown, (Genoese.) sprung aleak and was abandoned on Carysfort Reef.
Aurora, Rondout for Boston, a total loss off Chatham New Harbor, Aug. 2.
Hamlet, of Wilmington, N. C., went ashore at San Juan, (Nic.,) total loss.
Isaac Carver, at New-York from Cardenas, was struck by lightning at the latter port.
Wm. Pitt, Baltimore for Boston, put into Norfolk, Aug. 7, leaking.

Oleron, at Boston from Philadelphia, got ashore on George's Island, Aug. 10.
R. H. Moulton, Boston for Doboy Island, was struck by a waterspout, about 140 miles S. E. of Cape Henlopen.
Waitstill, New-York for Rio Grande, sprung aleak and was abandoned.
St. George, New-York for Salem, went ashore, Aug. 9, near the Cuttyhunck Lighthouse.
Timothy Crosby, Eastport for Jamaica, returned, Aug. 3d, leaking badly.
Balcordra, of Nova Scotia, abandoned, was fallen in with, July 25, and towed into port.
Jere Fowler, Philadelphia for Boston, was run into, Aug. 6, and sank immediately.
John Guttenberg, New-York for Boston, went ashore, Aug. 9, on the Sow and Pigs.
Bonaparte, at Salem from Philadelphia, was run into, 20 miles from Cape Cod, by unknown schooner.
Welford Fisher, St. John's, N. F., for Pictou, N. S., totally wrecked at Cape Race, July 30.
Venus, (Br.,) at Providence, lost maintopmast, July 21.
Anziko, of Halifax, totally lost near Plum Island Point, (Jam.,) July 4.
Unknown, was ashore, Aug. 10, on George's Island, below Boston,
Delmont, Locke for Boston, was struck by lightning, Aug. 13, off Brandywine light.
Unknown, (herm.,) was seen ashore on the Three Sisters, Aug. 13.
Ohio, of Salem, abandoned at sea, was insured for $4000, equally divided between the Thomaston and Rockland offices. There was also $1000 insured in Boston on freight money.
Loch Lomond, at Philadelphia from Shields, reports, 19th ult, lat. 43½, lon. 38 55, during a heavy gale from S. W., lost foretopmast and main topgallant mast.

SCHOONERS.

Unknown, was passed, June 3, dismasted and abandoned.
T. B. Scranton, Guayacualcas for Boston, put into Key West, leaking.
Morea, at Boston from Thomaston, with lime, took fire, and was scuttled.
J. S. Wilson, New-York for Wilmington, N. C., in collision, and lost bowsprit, jibboom, &c.
D. C. Brooks, Portsmouth, at anchor in Vineyard Sound, was run into and considerably damaged.
Groveland, at St. John's, N. B., from Boston, was destroyed by fire, July 29.
Hannah Snow, was lost previous to July 20, no particulars.
Gen. W. H. Harrison, at New-Orleans from Pensacola, considerably damaged by fire, July 21.
Unknown, lumber laden, was seen ashore off Tinicum Island.
J. H. Flanner, July 21, at anchor below Chester, was run into by sch. Helen Mar.
Golden Rule, Norfolk for Charleston, put back, with loss of sails.
Jane Elizabeth, at Aransas, (Texas,) from New-Orleans, was leaking badly, June 19.
Juana, Saco, (Me.,) for New-York, put into New-London, Aug. 7, in distress, had been sunk.
Anna E. Cox, (3 masted,) Bridgeport for New-York, got ashore, Aug. 9, in Hurl Gate.
Paragon, of Scituate, at anchor in Rockport harbor, went ashore on the Breakwater, Aug. 8.
H. Payson, at Philadelphia, was run into, Aug. 10, while at anchor above the Ledge Light Boats.
Unknown, was seen full of water, and ashore in Quick's Hole.
Col. John McRea, New-York for Wilmington, N. C., was struck by lightning, July 31.
Victory, (sloop,) for New-Haven, ran ashore on Stratford Point, Aug. 8.
Challenge, dragged anchor at Marblehead, Aug. 7, and went ashore on Bowden's Rocks.
Resolution, Gardiner for Boston, put into Portland, Aug. 10, leaking.
Hudson, at Newburyport, had been run into four times, and was much damaged.
Richmond, was damaged at Beverly by fire, Aug. 10.
Theresa Jane, (Br.,) put back to Philadelphia, Aug. 10, leaky.
Judith Ward, for Richmond, Va., sprung aleak and sank, Aug. 13, and will be a total loss.
Samuel Rankin, Rockland for New-York, was ran into, Aug. 10, and considerably damaged.
Henry Ware, Boston for Miramichi, N. B., went ashore, Aug. 9, on Prince Edward's Isle.
Henry Payson, while at anchor, Aug. 10, was run into by an unknown sch.
St. Lawrence, at Philadelphia, was in contact with schooner Augusta, Aug. 9, the A. put back for repairs.
Providence, was run into by ship Republic, off Barry Head, July 27.
Mary Williams, capsized about 6 miles from Buffalo, New-York.
Agnes Barton, (80 tons) for Buffalo, New-York, sank 2 miles from the harbor.
Elizabeth, St. Marks, for New-York, was struck by lightning, July 31, near Port Leon, and destroyed.
C. A. Heckscher, at Philadelphia, was struck by lightning in Delaware Bay.
Columbus, Plymouth, N. C., for New-York, totally wrecked on Deal Beach, July 21.
Virginia, of Richmond, was in collision with propeller Acorn, the A. was much injured.
Coquette, (pilot-boat,) was run into by a sch., in Boston Harbor, and much damaged.
Lagrange, returned to Rockport, Me., had been in collision with an unknown sch.
Gazelle, for Jacksonville, put into Wilmington, N. C., with loss of some spars, sails, &c.
Le Merchant, (Br.,) at Baltimore, had got ashore while entering the harbor.
Mary Caroline, New-Orleans, was lost at Tampico.
J. H. Hicks, of New-Haven, was struck by lightning at Tampico.
Perseverance, Portsmouth, N. H., for Arichat, wrecked near Seal Island, Aug. 19.
Sea Lion, for Gardner, Me., put into Edgartown, Aug. 11, had lost sails.
Abigal Gould, Steuben, Me., from Boston, ashore, 17th, on Schoodac Island, Me., crew saved, vessel will be a total loss.
Aurora, Gouldsboro for Boston, ashore on Abbott's Ledge, 17th, crew saved, a total loss.
Brave, for Albany, at anchor on Pollock Rip, run into by an unknown sch., which stove her starboard bow, carried away fore rigging, broke sheet anchor, sprung bowsprit, &c.

Commercial Department.

BOSTON AND EUROPEAN STEAM NAVIGATION.

We hail the announcement of this new enterprise with unbounded satisfaction; not only because it indicates the growth and prosperity of American commerce, and especially the financial strength and energy of Boston, but because it is destined to mark a later era in the progress of Steam Navigation which shall reflect honor upon American genius. As the exponent of commercial strength and greatness, England was the first to stand forth to link the two continents by steam, and maintain regular lines of communication between the shores of the Atlantic Ocean. At that period, not more than 19 years ago, her enterprise and skill received, as it deserved, the unfeigned praise of the civilized world. When the Cunard steamers first made the passage from Liverpool to Boston in 14 or 15 days, a distance of only 2,800 miles, it was thought, with good reason, a wonderful feat in navigation. Our oldest merchants regarded their success as the culmination of perfection in "packet" sailing, leaving nothing more to be desired—perhaps, not possible to be attained. Our young men, of inexperience but ambition, felt desirous to have our own country engage in a struggle for supremacy in wielding the new ocean power, as victory had long before perched upon the bunting of American Sailing Packets, while they silently pocketed the reflection, that our time had not come—none of our commercial cities felt strong enough for the enterprise, and, besides, it was doubtful whether it would *pay* to enter upon a career of bold competition with British capital and skill, already in the field. But ambition and prosperity in the New World at length grew equal to the task, under the fostering spirit of the National Government, and New-York became charged with the duty of vindicating American prowess in Atlantic Ocean Steam Navigation. No other city of the Union

was at that time so well prepared to undertake the adventure. Nobly did she acquit her fame. Her enterprise was regarded as national; and sister cities rejoiced at her success. The Collins steamers were regarded, almost the world over, as the highest monuments of marine art in an improving age. They narrowed the Atlantic to a twelve days' voyage; excited a vast improvement of speed in the British steamers of later construction; and as they came out, one after the other, they gave renewed assurances of American superiority in speed—about $10\frac{1}{4}$ days being the average time of the ill-fated *Arctic*, between New-York and Liverpool, not far from 3,200 miles. Such has been the history of Steam Navigation between the United States and Great Britain. American lines have also been established to the Continent, where we have, as yet, found no rivals, though on the eve of receiving the first visit of the first steamer of a German Line from Hamburgh to New-York.

Philadelphia has long since sent her screw steamers out upon the Atlantic to engage in European trade, but it has been reserved to Boston to follow New-York in a preparation to open the lists of active, energetic competition for the palm of supremacy in Atlantic Steam Navigation with Europe, between the cities of the Union. It is no longer with the established lines of England that the race of fortune is to be run. It is sufficient to wrest the pennant from New-York. Such has been the triumphant progress of modelling and engineering in this country during the past fifteen years, keeping pace with the accumulation of commercial wealth. And our success is especially gratifying, because we find the elements of prosperity distributed in an equilibriating ratio between all parts of the country.

Boston is already distinguished, not only for the magnitude, but speed, of her ships, in every sea where canvas is to be found; what has she to fear in entering upon a career with steam? She proposes to narrow the Atlantic to an 8-day voyage, carrying 1,000 tons of freight, and maintain a line of three steamers, unequalled in magnitude and speed by anything now on the ocean. This line, in finance, enterprise, and skill, is to represent the *people* of Boston, and not a few speculative

individuals. Here is a basis for success as sound and reliable as the granite masses which compose their docks and warehouses. Yet it is said that the Boston and European Steamship Co. will not be able *to get their stock taken.* What a singular hallucination of conservatism, doubt, and jealousy! What new invention, bold enterprise, and startling truth, does not make *fogies* of us all? How many minds there are, incapable of believing aught but their own narrow experience—skeptical in science—infidel in art! Why, the very mind that sometimes conceives the boldest and truest thoughts, will, through its own pride of opinion, deny the inspirings of another's genius, until interest or experience tears away the veil from its contracted vision. Conclusions drawn from our own secret weaknesses are never to be trusted; they are unsound and unsafe. In this light do we regard all gratuitous doubts of the success which the movers of this enterprise deserve, and are accustomed to have.

On the question of finance, it can be shown that Boston is abundantly able for the undertaking, and the investment can be demonstrated to promise abundant returns, provided the *speed* shall be accomplished. Here, then, we desire to grapple the question. We are glad to find it poising upon this issue. It is for this reason we hail the spirit of its movers with special favor —because an advance is to be made in the speed of Ocean Mail Steamers. It has been attempted to set up a standard of velocity, beyond which steamers cannot be propelled by engineering skill. The conceited absurdity of such an arbitrary dictum it is becoming desirable to see exploded on the largest scale, as unworthy of the mechanic, or the man of science.

Our experience in Ocean Steam Navigation is in an infantile state; and nothing but ignorance of the laws of nature, underlying marine architecture and engineering, prevents us doubling even our present rates of speed; yet, it is sought to be proclaimed that steaming and sailing has already culminated in the hands of a few fortunate mechanics and merchants. Narrow must be that perception which cannot discover an eternal state of progression in the mind of man, destined to be displayed in succes-

sive steps of advanoement so long as progress shall be essential to the happiness of mankind.

The announcement of an increased rate of speed, as within the reach of marine architects, has almost universally been received with doubt, whether applied to steam or sailing vessels; yet there have been a few minds so perverse and idealistic, as to assert the practicability of propelling vessels, at least one-third or one-fourth faster than the highest point of velocity once tolerated by public opinion. That one obscure man of science, as well as experience, could see farther into the mysteries of modelling and engineering than the multitude, who gave no time to thought and observation, was not to be credited. Subsequent experience, however, has demonstrated the feasibility of feats, the mere mention of which had subjected its author to ridicule; and we are now enabled to measure, in years, the advance of a few daring minds before the age. He is no visionary enthusiast who does not get ahead of his age, in progress, at least, *one* generation of time.

In 1849, when the Cunard steamers were astonishing Europe by a performance from Liverpool to New-York in 13 days, and when the Collins line were preparing to accomplish the same feat in 12 days, John W. Griffiths, a Marine Architect, of this city, now *Sen. Ed. Naut. Mag.*, made a proposal to the Government at Washington, to build a war-steamer capable of crossing the Atlantic in 8 days! In 1850, he published a large "Treatise on Marine and Naval Architecture," now in its fourth edition, in which he urged, with all the force of scientific argument, that the Atlantic *can*, and *ought to be*, crossed in 8 days by mail steamers. Three years rolled away, and he was found giving shape and dimensions to an experimental steamer, to perform the voyage from New-York to Galway in 7 days—the distance being about the same as between Boston and Liverpool.

In the "Shipbuilders' Manual," published the same year, Mr. Griffiths furnished the dimensions and sketch of design, with a lithograph, of the "William Norris," so called after the enterprising man who first taught the world to run locomotive

engines up an inclined plane, and from his Works in Philadelphia, for many years furnished Britain herself with her best locomotives from this side of the ocean. William Norris was the first man in America to embark his fortune in the construction of an 8-day steamer, grown by the progress of science into the ideal of a "six-day steamer," a title he felt sanguine she would prove worthy of on the time of trial, and such the public named her. The engagements of delinquent parties in Europe, to Mr. Norris, crushed the enterprise—he failed; no men of spirit and capital were found to carry out the design—and the vessel was sold, and adapted to other purposes. In this misfortune New-York lost her prospective laurels; the subsequent trial of the "William Norris," *alias* the "Ocean Bird," proved that she could have accomplished her projector's aims. But, as the *seed* of clipper shipbuilding was sown in New-York, and reaped in Boston, even so, the pebble which fell from the fingers of a New-York mechanic has projected its ripples on the tide of progress to the farthest bound of Boston Bay. In entering upon a career of ocean steam navigation, the citizens of Boston begin where New-York dare not yet advance. Careful, practical men—men who have saved fortunes by toil and industry, frightened by no bugbear of precedent, spurred by the demands of interest, enterprise, and honor, are about to stake their reputations and their fortunes upon accomplishing the so-called vagaries of science, first seriously announced but little more than six years ago. For aught we know, some of the very men who derided an *idea* then, are heart and hand in the project now. The press of Boston are enlisted in favor of the scheme—that of New-York is amused at the joke. It would, indeed, be a joke to re-enact the fate of Charleston, S. C., once the proud metropolis of the New Continent.* The Boston *Daily Advertiser* says: "It is safe to conclude, that the speedy establishment of a direct line of first-class steamships, of improved construction, such as are contemplated by the projectors of the proposed line, will sensibly and practically diminish the actual length of the voyage, and thus bring Europe two days nearer to America." Speaking of the extra-

* See page 536—."Influence of the Gulf Stream upon the Trade of Charleston."

ordinary performance of the Collins' steamer Baltic, the only vessel that has yet measured the ocean in less than 10 days, (9 d. 12 h. 15 m.) between Liverpool and New-York, and, with the Arctic, once made an eastern passage in 10 days and 3 hours —the *Advertiser* allows, "this for a route of 3,200 miles, is an average of 320 miles per day." Now, with the improvements, both as regards the models of the vessels and the power of their engines, contemplated in the steamers of the proposed line, it is thought, within bounds, to estimate that an increased rate of speed, of at least *one* mile in an hour, will be attained, making 344 miles in a day, which will allow the direct distance between Boston and Liverpool, 2,800 miles, to be accomplished in *eight days.*" But it will be found, on referring to the "Schedule of Passages by the Collins, Cunard, and Bremen Steamers, for 1854," page 368, vol. 1, of the Nautical Magazine, that a gain of only *one* mile in the hour above the speed of Collins' steamers *will not* secure an "eight-day" steamer on the route from Boston. The average time of Collins' line on the Eastern passage, in 1853, was 11 days and 29 minutes; on the Western passage, 11 days 18 hours and 33 minutes; on the Eastern passage, in 1854, 11 days 5 hours and 33 minutes; and on the Western passage, 12 days 2 hours and 31 minutes. Both the Collins and Cunard line are depreciating in performance annually. It is altogether probable that the average time of the Collins' line on the Eastern passage during the present year, 1855, will vary but little from 11½ days; and on the Western passage, 12½ days. At the former speed, the daily performance will be 278 miles; and at the latter, only 256 miles. It will thus appear, that an *eight-day* steamer, between Boston and Liverpool, will have to exceed the *present* rate of steaming in the Collins' line from 2¾ miles to 3⅔ miles per hour. And yet, this need not alarm stockholders, *if the proposed steamers shall be what they should be.* The new Collins' steamer *Adriatic,* now building by George and James Steers, in this city, will, without doubt, be capable of making the Atlantic passage within ten days, either way, the year round; and often bring the passage nearer 9 than 10 days.

With the exception of the *Adriatic,* no marked improvement

in speed beyond the standard of 1853 has been attempted in the construction of the new steamers at this port now building to complete the complement of the various lines to Europe. The people of Boston will, therefore, enter the field in a most auspicious time; but, if they wish to make their mark upon the history of steam navigation, a speed of *eight days*, across the Atlantic, is the very slowest time that ought to be entertained for a moment. Even this moderate degree of advancement, enough, perhaps, for one long stride, will leave a margin, inviting enough, in the heat of competition, to command the capital in Wall-street, which shall mould, and give motion, to steamers of 5,000 tons, making the passage to Europe in *six days.* For it will happen, that when a Boston steamer makes the passage in 8 days, a wonderful enlargement of *faith* will grow in the minds of men; and *self-interest* will inspire a degree of *confidence* hitherto deemed marvellous in mechanics, who were thought to grasp only at moonshine. It will then be wondered at, in New-York, why the "William Norris" never crossed the Atlantic!

We will now consider the consequences, as affecting the growth and welfare of Boston, which must flow from the establishment of a line of eight-day steamers to Europe.

With her far spread network of railroads, Boston will disseminate in all directions the advantages afforded by this diminution in the distance between the old world and the new. She will become the point of attraction for going and coming—intelligence, mails, and specie, passengers and goods, will flow through her in one unbroken stream, and enrich her as a river waters a valley. A Mississippi of trade will be hers. All Canada and the West will fix their eyes on Boston. Even New-York itself, will travel *terra firma* eastward, on its way to Europe. Moreover, as distance is diminished by the standard of time, trade and travel will increase in geometrical ratio. Travellers for pleasure and for business will spring-up in new places. Europe and North America will exchange through Boston; and that city will become the termini of every railroad and packet line pointing east on this continent. It has the advantage over New-York in point of nearness to Europe, and on this account was origi-

nally selected by the Cunard Company, as the terminus of their line. The Canadian transit trade is expanding to an enormous amount annually, and the import trade of the West is already being systematically directed through Boston channels.

On the other hand, what will not Boston lose if she defers taking this projected step? It is notorious, that for several years New-York has been quietly and silently centralizing the European trade of the United States. Her steamers have vastly contributed to this result. Portland, Me., has became connected with Montreal by the Atlantic and St. Lawrence railroad, furnishing a rapid and easy communication with the Canadas, by means of the magnificent system of railways proposed under the auspices of the Canada Grand Trunk Company, with its immense resources. This company has also a perpetual lease of the first named road, intending to make Portland the point of transit between the Canadas and Great Britain. With Portland on one side, and New-York on the other, Boston cannot afford to postpone action. Her position, in New-England even, might become signally changed in a brief period. The golden opportunity is now presented as it may never be again. Internal trade and foreign commerce are reciprocal interests; they seek the same channels of inter-communication. With intelligence, enterprise, and capital in her hand, and with every reason to encourage and to threaten, it is difficult to see why Boston will not eagerly grasp the proposition which her most shrewd and enterprising citizens have made, to establish an eight day line of steamers to Europe. Indeed, the movement is already under steam; the people of Boston are wont to succeed in what they undertake, and it is only necessary to arouse their attention to secure the basis for an enterprise so auspiciously inaugurated, to render its consummation a matter of history.

On the 12th of July the first meeting was called by the movers of the enterprise, to consider the expediency of establishing direct communication with Europe, and to ascertain the state of public feeling in relation thereto. After a brief and spirited discussion, it was unanimously voted to be in consonance with the interests of Boston, to establish such a line, to consist of four ships. A committee to solicit subscriptions to stock was ap-

pointed, and the meeting adjourned one month. At the end of this period, the persons named in the Massachusetts act of incorporation of the Boston and European Steamship Company meet according to appointment, when the following proceedings were had:—

M. Beebe, Esq., was called to the chair; Hon. George Upton was chosen Secretary of the meeting.

The Act of incorporation was accepted by vote.

F. W. Thayer, Esq., was chosen Clerk of the Company.

The gentlemen appointed as a committee at the Merchant's meeting held on the 12th of July, were made members of the Company, viz.:—

Messrs. R. B. Forbes,	Messrs. Wm. Amory,
George B. Upton,	G. Howland Shaw,
Enoch Train,	John H. Pearson,
George B. Blake,	Wm. T. Glidden,
Saml. Hooper,	Wm. B. Reynolds,
W. H. Boardman,	Hamilton A. Hill,
Wm. Perkins,	Vernon Brown,
Isaac Rich,	Charles Bockus,
Andrew T. Hall,	A. W. Thaxter, Jr.,
James M. Beebe,	Ammi C. Lombard,
Francis Skinner,	Donald McKay,
Wm. F. Weld,	F. W. Thayer,
James Lawrence,	Wm. Bramhall,
James Sturgis,	Edward S. Tobey,
J. Bowdoin Bradlee,	Ezra H. Baker,
George R. Sampson,	Israel Whitney,
Nathl. H. Emmons,	E. D. Brigham,
Wm. B. Bacon,	W. S. Bullard.

The meeting also—

Voted, That the Committee appointed at a meeting at the Merchants' Exchange be requested to proceed and make their collections to stock in th Company, and that we adopt the following form of subscription:

The undersigned agree to take the sums set against their names in the stock of the Boston and European Steamship Company, on the following terms and conditions, to wit:—

(1)—That the sum to be subscribed shall be one and a half millions of dollars, and that no subscriptions shall be binding unless said amount shall be subscribed within twelve months of this date.

(2)—On the completion of the amount above named, a committee shall be appointed by the stockholders, for the purpose of building not less than three ships, to cost about five hundred thousand dollars each.

(3)—The shares shall be valued at $500, and each shall be entitled to a vote.

The meeting then adjourned to assemble again after the interval of a month.

The proposed steamships are estimated to cost $550,000 each. A model, furnished by Donald M'Kay, Esq., was exhibited at the first meeting, on behalf of the Company, of the following dimen-

sions and design; "length 320 feet; breadth 45 feet; depth 31 feet; engines of 85 inch cylinder, and ten feet stroke, with plenty of boiler."—The following estimate for a single voyage is based upon its capacity:

Cost of sailing for the voyage, about		$35,000
Interest and insurance		8,000
Depreciation		3,000
Repairs		3,000
		$49,000
220 first class passengers, $130	$28,600	
50 second " " 75	3.750	
1000 tons freight home, $35	35,000	
Freight outward	2,000	
220 first class passengers home	28,600	
50 second " " "	3.750	$101,700
Profit for the voyage		$52,700

In conclusion, we have only one suggestion to offer—we hope our friends in Boston will not deem it impertinent, knowing, as we do, that it is designed their steamers shall embody every valuable improvement known to marine art, which can either contribute to the comfort of passengers, or the security of freight—in short, that their line shall stand unrivalled in popular favor with the public. Were this not the intention, we would feel justified, not only in framing a suggestion, but in making a demand, in behalf of the public, that each steamer be made a *life-boat*, by means of increased longitudinal strength, and a system of compartments in the hold, in combination with a powerful steam pumping and fire apparatus, such as can be devised, capable of commanding "rivers of water," if necessary. With these views realized in the construction and arrangements of the ship, and a judicious system of discipline enforced, the confiding passenger, woman, child, or invalid, may be as safe on the ocean as on the land. There are other means of safety to provide, we know, but we speak now in reference to sinking or burning the ship.

It is expected that Donald McKay, Esq., of East Boston, the builder of the "Great Republic," will construct the vessels of the Boston and European Steamship Company. It is the proud boast of the friends of this gentleman, that of the many celebrated ships which he has launched, not one of them has ever

cost the underwriters *one dollar* for losses at sea. May we not, then, reasonably expect, that so great a means of safety, not only important in itself to underwriters, but paramount to every other consideration with confiding passengers, will be secured by IRON keelsons and compartments—a material that being once *calked* will remain so, and for a given cost in dollars, will furnish *eight* times more strength than any other.

BATES.

THE CARRYING TRADE.

AT the time of the breaking out of the war in Europe, the expectations of our ship-owners were great, being based upon the advantages that seemed likely to accrue from the employment of American ships in the carrying trade, during the progress of the war.

These expectations have not to any very considerable extent been realized; and the reason must appear obvious when we consider that the maritime force of Russia is too inconsiderable to justify her in venturing the navigation of an open sea, and as one of the consequences, a complete blockade of all Russian ports, hence it is quite clear that vessels sailing under a neutral flag can only be employed by one of the belligerents; the other being entirely shut out from the benefits of commerce, can neither employ her own ships, nor those of other nations.

The advantages American ships possessed for the transportation of troops was not overlooked by the governments of England and France; their superior model, adaptation, and ventilation attracted the attention of Messrs. W. S. Lindsey & Co., of London, who, in December, 1854, opened a correspondence with the French Minister of War upon the subject. The Minister at once acknowledged their superiority, and expressed a willingness to employ them, but was in doubt as to the interpretation which would be put upon the act by our Government. It will be remembered, that at a subsequent period one of our enterprising ship-owners, who was also in doubt as to the course which would be taken by our Government towards vessels thus

employed, when they returned to American ports, sought (by a letter to the Secretary of the Treasury at Washington) such information as would enable him to know whether a charter of an American vessel to the British or French Governments, to carry troops, horses, stores, &c. to the Black Sea, would be regarded by the Departments as a violation of the neutrality laws. Mr. Guthrie referred the letter to Mr. Marcy, Secretary of State, who replied in a note, of which the following is a copy:

DEPARTMENT OF STATE,
Washington, April 3, 1855.

DAVID OGDEN, Esq., New-York.

SIR:—Your letter of the 30th ult., inquiring of the Secretary of the Treasury whether an American ship can be "chartered to the British or French government to carry troops, horses, stores, &c., to the Black Sea, without violating the neutrality laws of the United States," having been referred by him to this Department, I now have to state, in reply, that it is contrary to the usage of this Department to express an opinion in hypothetical cases. I would suggest to parties who contemplate embarking in enterprises of questionable legality to seek professional advice on the subject.

I am, sir, respectfully,
Your obedient servant,
W. L. MARCY.

Previous to this, Messrs. Lindsey & Co. addressed a note of inquiry upon this subject to the American Minister at London, who furnished the following satisfactory reply:—

LEGATION OF THE UNITED STATES,
London, 12th January, 1855.

GENTLEMEN:—An absence of several days from London, has prevented me from answering at an earlier period your letter of the 4th January.

In reply to it, I have to say that I know of no law or treaty of the United States, rendering it penal for an American citizen to hire his vessel, now in Europe, as a *mere* transport to either of the belligerents engaged in the present war. Whilst employed in this service, however, she would be liable to capture and condemnation by the opposite belligerent.

Yours, very respectfully,
JAMES BUCHANAN.

To MESSRS. W. S. LINDSEY & Co.

Notwithstanding the decided opinion so frankly expressed by our Minister, which has since been concurred in by the ablest members of the Bar of this city, many ship-masters still hesitated; the service was entirely new and novel, and its risks not fully ascertained. Captain Ryan, of the White Falcon, was the pioneer, and engaged his ship of over 1,300 tons, from four to thirty months, optional with the charterers, at 20s. sterling

per month for each ton of register, all port charges to be paid, and the risk of seizure to be borne by the French Government. This opened the way, and the applications from ship-masters became quite numerous, and Messrs. Lindsey & Co. not only readily filled the orders they had received from the French Government, but were obliged to reject many which were proffered. Inasmuch as this was a season of commercial depression, many American vessels went to France, and made direct application to the Government after being refused by the London agents. The Government, however, declined to interfere, and subjoined we have a list of all the vessels thus engaged by the French Government, up to a late date, through Messrs. Lindsey & Co., or their Liverpool correspondents, Messrs. Lamport & Holt. The following vessels were taken at 17s. to 20s. per ton, per month;—

	Brit. Reg. ton.		Brit Reg. ton.
White Falcon	1,316	Rattler	1,121
Ocean Herald	2,135	Saladin	900
Ticonderoga	1,524	Great Republic	3,424
Emma Jane	1,176	Alleghanian	1,124
Golden Gate	1,237	Nonpareil	1,210
Edgar P. Stringer	1,419	Monarch of the Seas	2,359
Gauntlet	1,637	Sumroo	1,200
Queen of Clippers	2,190	Swiftsure	1,400

The following British and American steamers have also been chartered by the French Government, at rates ranging from 45s. to 63s. per month for each registered ton, the Government finding coals:

	Tons.		Tons.
Empress	775	Scammander	1,022
Pactolus	1,156	Enniskillen	712
Wm. McCormick	684	Athenian	1,040
City of Manchester	2,109	Falcon	448
Eglinton	313	Nicolas I	850
City of Baltimore	2,367	Cleator	365
Great Northern	578	Wearmouth	594
Lady Berrydale	393	Sea Nymph	703
European	2,359	Columbian	2,189
Napoleon III	1,500	Caledonian	1,400

It is reported, but we believe not officially, that the Star of the South, 1,200 tons, has been added to the list. It is also

reported that the Ericsson has been offered 45s. per ton per month, but refused.

We believe some charters have been made by the British Government, to convey recruits from this city, but our Government becoming informed of the fact, the whole scheme was broken up. There can be no question of the illegality of attempts to transport an armed force from our shores to invade the territory of a nation with whom we are at peace; but the right of any American ship-master or owner, whose vessel is in a foreign port, to charter her there, to either of the belligerents, appears unquestionable. The only peril such vessels incur is that stated by Mr. Buchanan—the liability to seizure by the opposing belligerent. Against this danger, which may be considered indeed remote, under the circumstances, the French Government gave a guaranty in the charter-party signed by their agent.

NAVAL CONTRACT,

For supplies of Oar Rafters, Capstan Bars, and Hickory Butts, to be delivered at the Gosport Navy Yard, when required, during the years 1855 *and* 1856.

A contract was recently made with F. C. Herbert of Portsmouth, Va., to furnish the above in quantities and at prices, as follows:—

70,000 feet white ash oar rafters, 13 to 18 feet long, 3½″X3½″ loom, blades one-third of the length of oar, width of blade 6½″ 1¾″ thick at end, to be straight and riven, at 11 cts. per foot of length.

150 hickory capstan bars, 12 to 15 feet long, 6″X6″ at butt, and not less than 4″X4″ at top end, to be straight and riven, and clear of heart pith, at $1.25 each.

140 hickory butts, 14 feet long, 12″ diameter, at small end, at $2.50, each.

STATE DEPARTMENT.

Removal of the Tonnage Duty at the Port of Amsterdam.—By a recent letter from a correspondent residing at Amsterdam, we learn that the States General have passed an act which removes the necessity of paying tonnage duty at that port. It takes effect from the 1st of January, 1856.

The American bark Mary Anna was wrecked on the morning of the 15th ultimo on the Rottasner Grounds, on the coast of Friezland. All on board were saved.

CHAMBER OF COMMERCE.

A REGULAR meeting of the Chamber of Commerce was held, in July, at the Merchants' Bank, Pelatiah Perit, President, in the chair.

The minute of the last meeting was read and confirmed, after which Mr. E. M. Young was elected by ballot, as a member of the Arbitration Committee, vice Mr. Arthur Leary, whose term expired.

The resignation of Captain Cartwright as Marine Surveyor, was received, and Mr. Gideon Fountain, late Harbor Master, was elected to fill the vacancy.

The President then handed in the following communication from ship-masters at the port of Bombay, relative to their guidance while staying at that depot:—

BOMBAY, May 26, 1855.

TO THE HON. CHAMBER OF COMMERCE OF NEW-YORK:

GENTLEMEN—The undersigned, captains of American ships, and Americans, now in Bombay, beg to lay before your honorable body the present existing state of affairs regarding the manner in which assistance or protection is refused by the government of India to the United States Consul at this port, and through him to American life and property. English ships arriving at this port are, in case of mutiny, or refusal of duty on the part of their crews, protected by the police authorities, who imprison the men on shore; whereas American ships under the same circumstances are refused all protection or relief from the local authorities whatever, and are often prevented or deterred from using such means on board as the security of the lives of the officers or safety of the ship and cargo demands.

The ship Napoleon, Captain Chatfield, of Boston, arrived at this port on the 29th day of May, 1854, and soon afterwards the crew refused duty unless a month's pay was given them and liberty to go on shore for a few days. This, of course, was refused; but the crew, who had shipped in Boston, to perform the whole voyage, now insisted upon having their discharge, and the captain applied to the Consul for assistance. The Consul, in turn, applied to the local authorities, but was refused any assistance whatever; and, in the meantime, the crew had procured liquor and became riotous on board. They assaulted the captain, and maltreated him severely, compelled the second mate to save his life by jumping overboard, and took mutinous possession of the ship. The Consul then applied to the Commander-in-Chief of the Indian Navy, who, as a matter of courtesy, sent a file of Marines on board, and had four of the ring-leaders put in close irons and removed on board one of the ships of war. The Consul afterwards paid the passage of these four men to Calcutta out of his own private purse, with the expectation of the Consul at thas port forwarding them to the U. S. for trial.

The ship David Brown, of New-York, Captain Brewster, arrived at Bombay on the 8th May instant, and the day following the crew, although they had signed articles in London to return to a port of discharge in the ship, yet, knowing there was no assistance granted to the master or Consul, refused further duty without any cause whatever. In this case the Consul, with the assistance of several American ship-masters in port, succeeded in confining them all in irons, on board the ship, until they were willing to return to their duty; but this course also was attended with much loss to the ship, in the retarding of the work, and employing of native laborers and watchmen from the shore.

In view of the increasing number of American ships visiting this port, we venture, in behalf of the commercial interests of the United States, to call your attention to the abuses and neglect which our said interest suffers in this port, and which, if suffered to continue, must greatly embarrass our intercourse with all parts of India subject to the same government, by rendering us, as masters, liable to great danger and annoyance, and our ships, your property, to heavy and needless expense, in procuring new crews, or ruinous delay in waiting, for crews often are not to be had at any rate of wages. The object of a voyage is thus often completely frustrated, as, in case of shipment of a native crew, we are bound by government, under heavy bonds, to return the seaman to India, which, of course, cripples us pursuing any voyage we may think best for the interests of the owners.

We therefore pray that you will consult your own interest, as well as the interest of the entire community of the United States, by pressing upon our government the necessity of immediately effecting a consular convention between the Governments of the United States and Great Britain, by which more ample powers may be conferred upon the United States consuls in the dominions of the East India Company, and more assistance granted to our commerce in the ports subject to that government. We all unite in paying a tribute of respect to Edward Ely, Esq., the United States Consul at this port, for the steady and determined manner in which he has granted us all the support and assistance in his power; and we consider that if his powers were more unlimited, much of the present abuse of our interests would be remedied, and the honor of the United States government more fully sustained.

Praying that you will give this subject your earnest attention, we remain, gentlemen,

Your obedient servants,
Geo. S. Brewster, ship David Brown, New-York.
B. W. Tucker, ship Swallow, New-York.
E. Burr Brown, New-York.
John G. Pendleton, bark John Gardner, Boston.
Leonard Gay, ship Samuel Adams, Castine, Me.
Hollis Moore, ice house, Bombay.
R. T. Marriott, Baltimore.

On motion of Mr. Barstow, it was resolved to transmit the communication to the Secretary of State, to be accompanied by a suitable letter, duly authenticated by the officers of the Board.

The Board then adjourned.

Shortest Run from Boston to Australia.—The clipper ship Ringleader, Capt. Matthews, of and from this port, October 17th, arrived in Hobson's Bay, Australia, January 5th, although she was detained off Pernambuco to land the first officer, who had broken his leg. The Ringleader made the run hence to Pernambuco in thirty-two days, and from Pernambuco to Hobson's Bay in forty-six days. Her best day's run was 336 miles. In one week she ran 1,980 miles; and in the month of December 7,700 miles. —*Boston Advertiser.*

We extract from the *United States Insurance Magazine* for August, the following recapitulation of the business of the leading Marine Companies of the City.

FINANCIAL CONDITION OF THE MARINE MUTUAL INSURANCE COMPANIES IN THE CITY OF NEW-YORK.

NAME OF COMPANY.	Assets.	Premiums Last Year.	Premi'ms not marked off.	Premiums marked off.	Losses Paid and unadjusted.	REMARKS.
Atlantic Mutual,	$2,912,616 80	$[illegible]1,109 3	$1,693,936 63	$4,003.209 12	$4,469,970 23	Dividend on one million of Scrip.
Atlas Mutual,	812,338 38	945,322 07	183,468 28	766,964 27	658,290 76	Do. on outstanding Scrip.
Astor Mutual,	509,949 95	454,676 35	243,226 37	515,572 44	776,884 70	[cent.
Commercial Mutual,	586,166 87	715,38[illegible] 05	202,926 96	700,798 34	609,582 71	The Scrip of 53 recalled and red. 59 per
Mercantile Mutual, (Marine and Inland,)	1,599,765 97	2,374,453 82	506,634 98	2,253,649 91	1.760 384 03	Dividend declared on outstanding Scrip.
New-York Mutual,	932,633 96	1,253,087 04	419,069 36	1,256,313 38	1,064,432 61	Script called in to be red. 25 per cent.
Orient Mutual,	790,244 96	[illegible]9 66	....	576,250 78	361.412 11	This is the first year's statement of the
Sun Mutual, (Fire and Marine,)*	1,598.325 36	1,939,078 93	478,168 91	2,071.738 29	1,744.348 01	"Orient."
Union Mutual,	1,041,367 67	649,076 14	256,347 67	635,872 95	493,324 78	

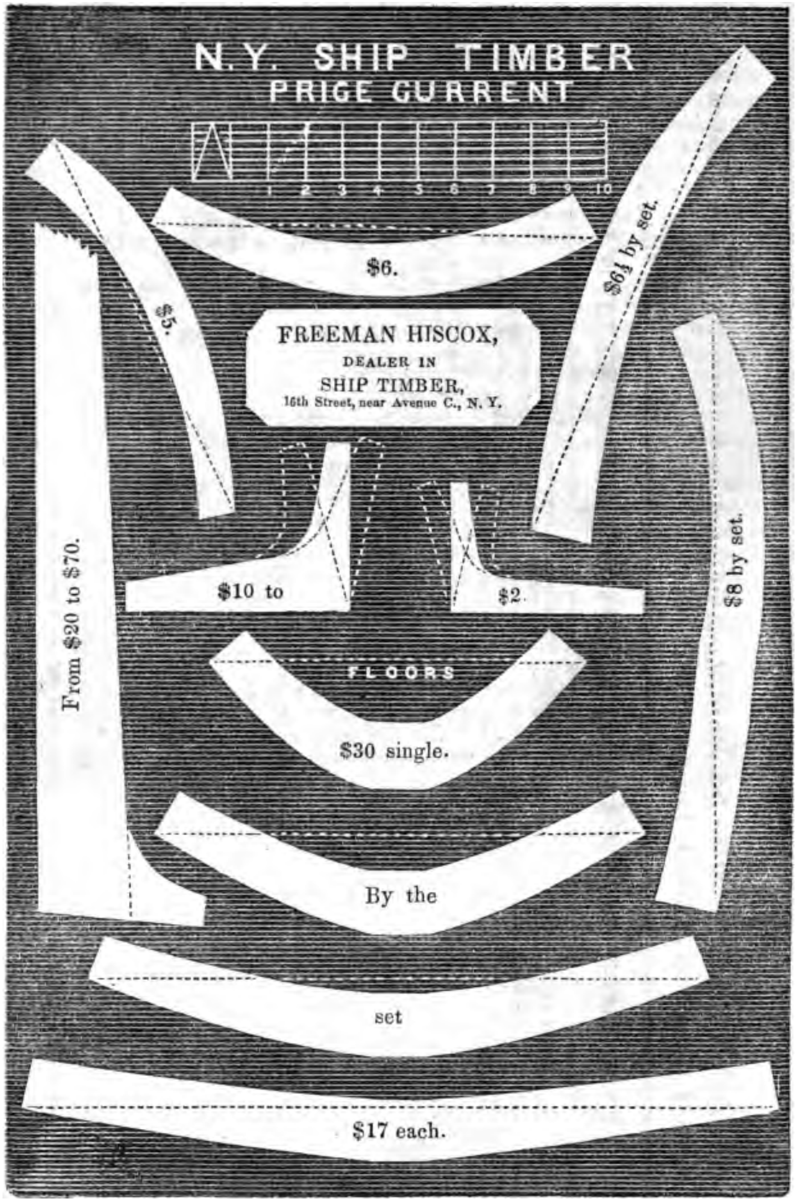
NAME OF COMPANY.	Expenses, &c.	Interest on Dividends.	Premium Notes, &c.	Close of Financial Year.	REMARKS.
Atlantic Mutual,	$554,047 57	6 per cent.	$2,[illegible]206 38	December 31st.	Dividend on one million of Scrip.
Atlas Mutual,	†36,031 24	Do.	730.782 79	" 30th.	Do. on outstanding Scrip. †Expenses included in Losses.
Astor Mutual,	148,970 30	None.	404,168 22	" 31st.◊	
Commercial Mutual,	157,818 30	Do.	548.008 92	June 30th.	The Scrip of '53 recalled and reduced 59 per cent.
Mercantile Mutual, (Marine and Inland,)	337,306 04	6 per cent.*	1,233,254 25	April 3d.	Dividend declared on outstanding Scrip.
New-York Mutual,	302,795 89	None.	629,603 17	March 14th.	Scrip called in to be reduced 25 per cent.
Orient Mutual,	133.911 57	15 per cent.‡	703,867 91	February 28th.	This is the first year's Statement of the "Orient."
Sun Mutual, (Fire and Marine,)*	292,564 82	3 per cent.	952,116 21	October 4th.	
Union Mutual,	154,256 43	None.	642,590 64	December 30th.	

* One half profits of current year to go in reduction of Scrip, and the other half to go to reserve fund until the same amounts to two millions. $166,410 44 of Premiums were on Inland Risks, and $111,997 23 of losses, do. $323,672 88 of Premiums were on Fire Risks, and $338,481 94 of losses were on same.

† $36,214 40 of losses were on Inland Navigation Risks. $157,986 00 of Premiums were received thereon.

‡ On earned Scrip Premiums.

◊ $55,081 8 is outstanding Premium accounts.—Old Scrip cancelled and new notes taken for $200,000.



A set of floors and futtocks, $9 each. Oak Flitch, 30 to 35 cents per cubic foot; oak plank, $33½ to $38½ per M.; deck plank, $30 per M.; hackmatack timber, 25 cents per cubic foot; chestnut, ditto; cedar, 35 to 40 cents; yellow pine timber, rough, $25 to $35; ditto, sawed, $30; yellow pine plank, $26 to $28 per M.

KNEES.—Oak, 5 inch, $3 each; hackmatack, $1.50; oak knees, 6 inches, $5; hackmatack, $3; oak knees, 7 inches, $7; hackmatack, $4.75; oak knees, 8 inches, $10; hackmatack, $6; oak knees, 9 inches, $12; hackmatack, $7; oak knees, 10 inches, $15; hackmatack, $10; oak knees, 10 to 12 inches, $15 to $20; hackmatack, $11 to $12. Locust remains as quoted in November last.

metal, 25 cents, at 6 months; copper sheet, 28½ cents, ditto; copper bolts, 31 cents, ditto; compo , 19 cents, ditto.

VESSELS SOLD.

YACHT Ultra, 100 tons, sold at auction for $2,500.

Steamer United States, sold to a Cuban firm for nearly $150,000, but has to be overhauled and have new boilers before they receive her.

Brig Caroline, 220 tons, 3 years old, built at Thomaston, sold for $8,000, cash.

Brig Aurate, (herm.) new, 298 tons, at private sale, terms not mentioned.

Sloop Prompter, 32 tons, sold at auction, in Boston, for $540, cash.

Bark Wavelet, 300 tons, 2 years old, was sold to Lawrence Grinnell, of New Bedford.

Brig Advance, 170 tons, 9 years, sold for $2,500.

Bark Philomela, 470 tons, 5 years old, sold in Boston, for $16,000.

Ship Serampore, sold Aug. 11th, at New Haven, 1/8 was sold for $1,000, cash.

Brig Pioneer, 235 tons, of Greenport, sold at New Bedford, price not known.

Steamer St. Louis, 2,060 tons, sold Aug. 15th, for $245,000, built in 1854, by J. A. Westervelt.

Bark Laurens, 14 years old, 420 tons, sold for $8,000.

Brig W. D. Miller, 174 tons, built 1853, sold for $8,100, for cash.

Brig E. Drummond, 249 tons, 2 years old, sold, and terms not mentioned.

Ship George Evans, sold July 28th, for $17,000, cash.

Ship Realm, 544 tons, 7 years old, was sold for a New Orleans packet.

Bark Orion, 450 tons, 7 years old, sold for $8,000.

Ship Margaret Scott, 1/8 sold at New Bedford July 30th, for $5,200.

A new ship, built at Hallowell, 900 tons, sold for $50 50 per ton.

Brig Ida Raynes, 309 tons, built 1854, sold at $15,000, 1/3 cash, 1/3 3 months, and 1/3 6 months.

Ship Resolute, 786 tons, 2 years old, now at sea, has been sold to a Boston firm.

Ship Ironsides, 1,350 tons, built at Bath, sold for $70,000.

Schooner F. W. Johnson, 100 tons, 10 years old, sold for $300, cash.

Schr. H. P. Stowe, (center board) 227 1-2 tons, built 1854, brought $10,-000 cash, at auction.

Ship Sea Belle, 822 tons, built at Kennebeck, terms not stated.

Ship India, 1-16 sold at the rate of $7,100.

Bark J. Walls, jr., 272 tons, built 1848, sold Aug. 4th, for $4,400, 4 months.

Ship Navigator, 416 tons, brought $10,000 in Boston.

Bark Ottawa, 279 tons, built at Baltimore 1851, sold for $11,000, cash.

Schr. Watchman, 140 tons, sold in Boston, for $7,000.

Schr. Odd Fellow, 92 tons, sold at San Francisco, for $2,000.

Bark Pointer, 1 year old, built at Portland, Me., 506 tons, has been sold for $26,000, cash.

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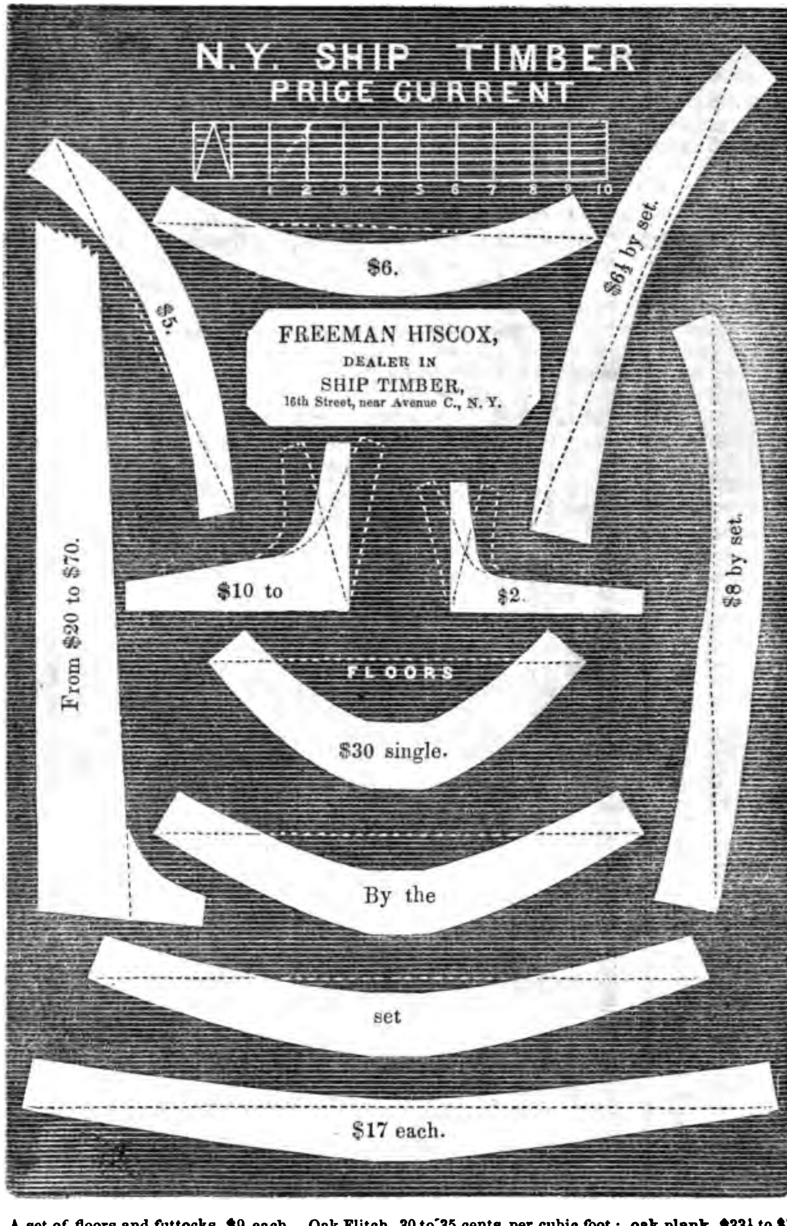
At Bath, new ship, not yet named, 1261 tons, sold at $51 per ton, cash.

The oldest merchant vessel known in France, launched in 1718, is about to be broken up, after one hundred and thirty-seven years' service. She was built of teak.



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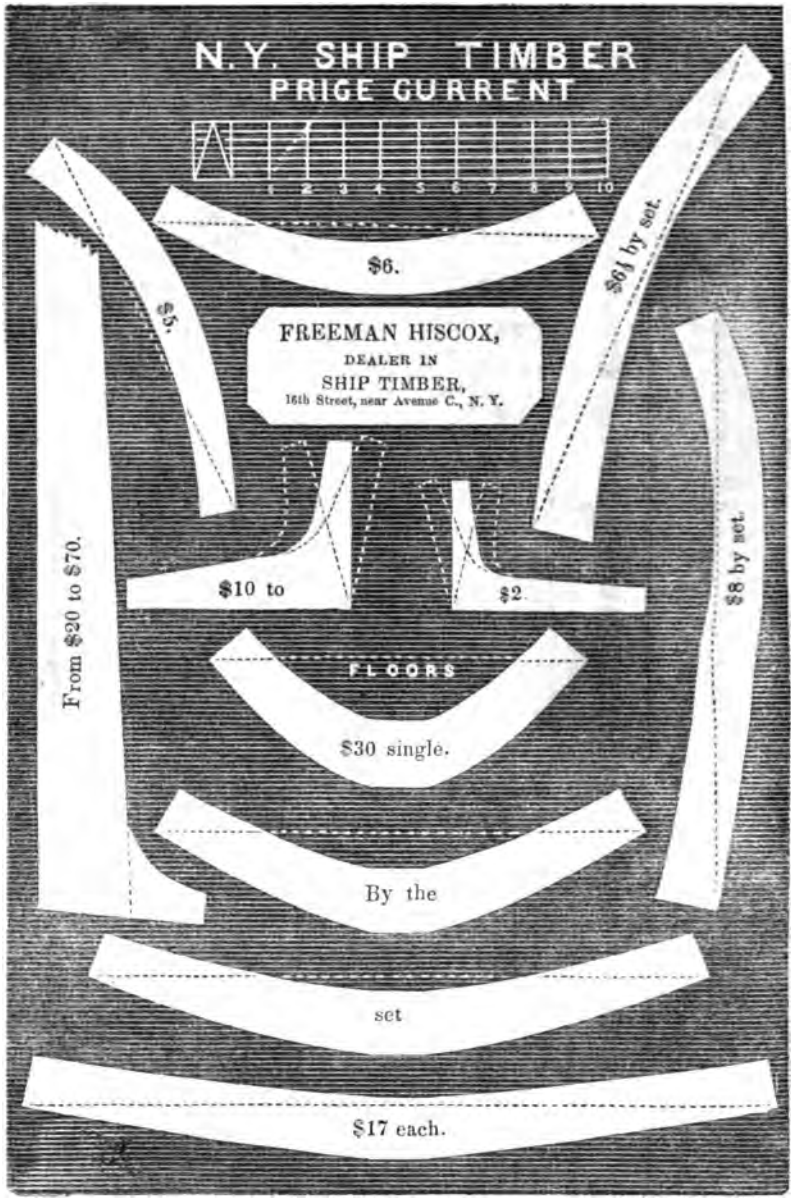

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